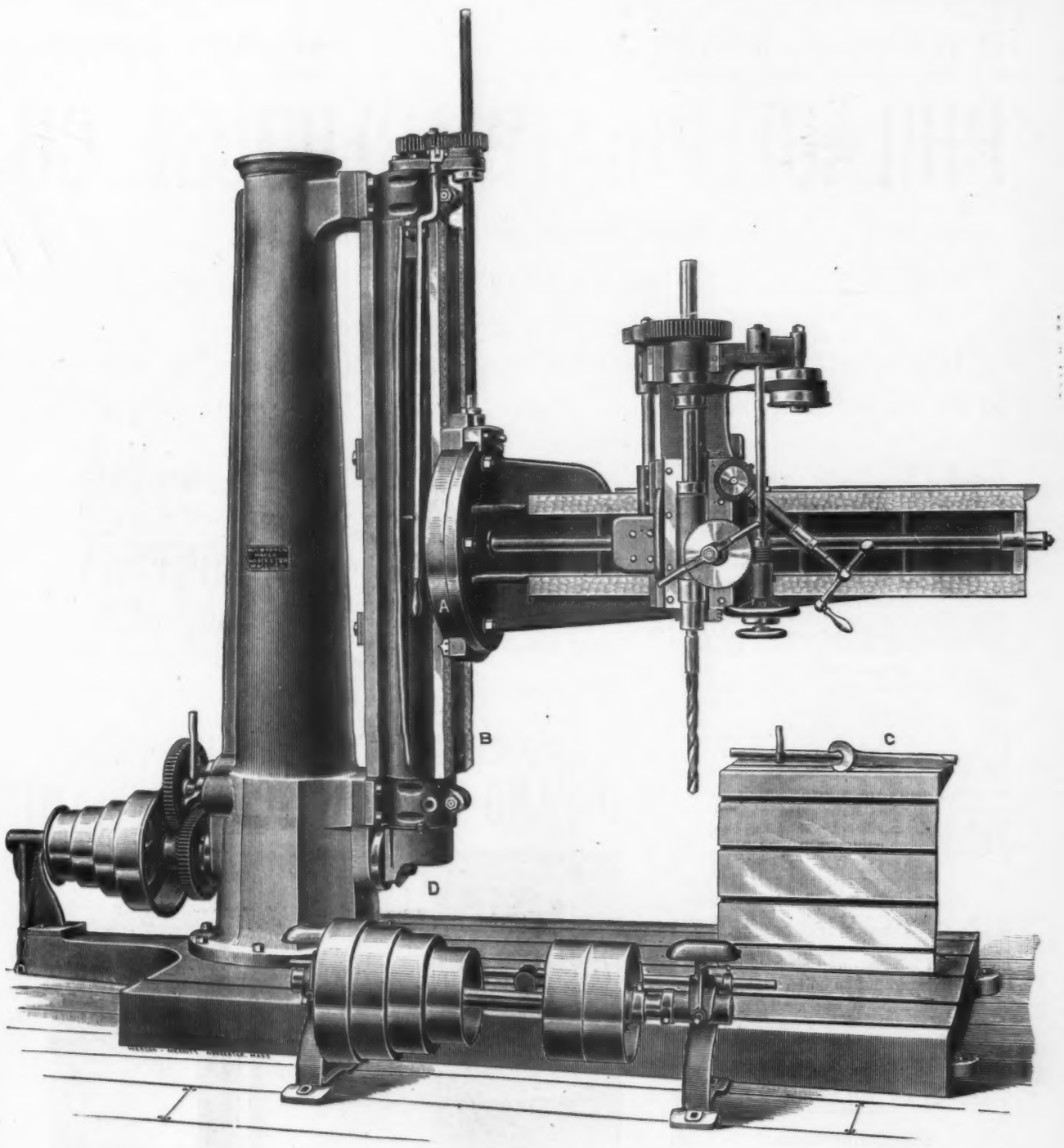
THE IRON AGE

THURSDAY, JANUARY 30, 1890

Balanced Spindle 6-Foot Radial Drilling Machine.

The machine we present in side and front elevations is a balanced spindle 6-foot radial drilling machine. The cuts show clearly the principal features of the machine and their arrangement and indicate the adaptability of the machine to a wide range of work. The hight of the column is 9 feet 1 inch, which includes the floor table, which is 6 inches in hight. The elevating-screw in its highest position is 12 feet. The greatest distance from the bed B to the center of the spindle is 64 inches, with 13 inches additional clearance in the throat D. The traverse of the head on the arm is 50 inches, while the arm itself radiates in a half circle. The distance from the spindle in its highest position to the floor table is 74 inches, and it may be lowered to 19 inches. The arm has a vertical adjustment of 40 inches and is raised and lowered by power. The head is moved on the arm by mechanism, so arranged with gears and rack that the operator can move it quickly, having the advantage of being over his work instead of using the screw at the end of the arm. The steel spindle is 2¼ inches in diameter, has a traverse of 15 inches and is driven by a 3¾-inch belt on a cone having four changes—15½, 12½, 10⅞ and 9 9/16 diameter. The arm can be turned to any degree, as it swivels on a graduated shoe, A, which is planed on tracks on the vertical bed B, on which it has a bearing of 29 inches secured by four large bolts. The utility of having the shoe planed on the tracks is manifest when the operator desires to throw the arm over and drill in a horizontal position, as he can raise and lower the arm to accommodate



Side View Showing Drilling Spindle in Vertical Position.

BALANCED SPINDLE SIX-FOOT RADIAL DRILL, BUILT BY W. H. WARREN.

the drill and counter-bore and yet retain its exact position with the work. The quick return and feed act the same in all positions. The great distance between the bearings on the vertical bed B obviates the necessity of tightening and loosening the grip bolts on surface drilling, thereby saving a large per cent. of time over the ordinary radial drill. The portable table C is 27 inches long, 23 inches wide and stands 24 inches high. When necessary it can be readily detached and large work placed on the floor table, the extreme dimensions of which are 127 inches long and 58 inches wide. This table is provided with five planed slots. All the shafts are steel and the bearings long and large. All the slides are scraped to fit. A speed of the countershaft of 190 drives the spindle on quickest speed 190 and on slowest with back gears 19 revolutions per minute. The balance weight runs on planed grooves and requires no adjustment in the positions shown. The shipping weight of the machine is 10,500 pounds. This and the patented 16 and 26-inch stroke traverse head shapers are specialties built by William H. Warren, of Worcester, Mass.

Marine Boiler Inspectors.

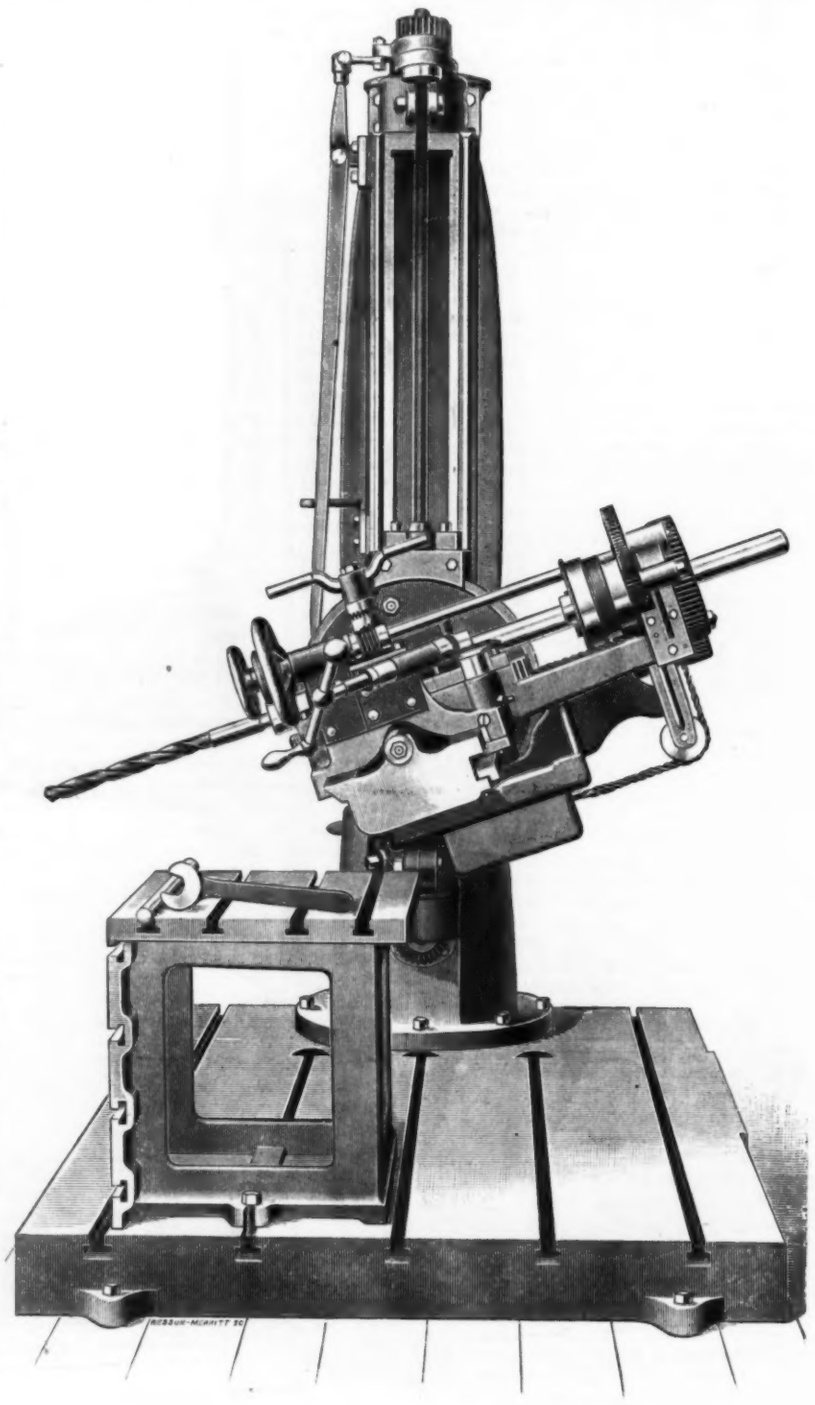
The Board of Supervising Inspectors of Steam Vessels has adopted an amendment to rule 2 of the regulations that will probably be warmly welcomed by steamship owners and masters. Section 1 of rule 2 provides that any boiler having been in use ten years or more shall, at each annual inspection thereafter, be drilled at points near the water line, and at the bottom of the shell or boiler, or such other points as the local inspectors may direct, to determine the thickness of material at such points and the general conditions of the boiler at the time of the inspection, and the thickness shall be determined thereafter at each annual inspection, and the steam pressure allowed shall be governed by such ascertained thickness and the general condition of the boiler. This rule, it has long been urged by vessel owners, operates to the great detriment of their interests by hastening the final collapse of their boilers, thus entailing on them a heavy expense. The annual boring of the boiler, it was argued, was entirely unnecessary and was a great strain on the material. Letters have been received by the Board from all sections of the country asking for an amendment of the rule. In fact there are very few, if any, vessel owners who do not advocate a total repeal of the boring regulation. The Board has decided to grant the request for an amendment by taking from the rule the clause providing for an annual boring of the boilers and substituting therefor one that the boilers need not be bored except when in the judgment of the local inspectors there is an actual necessity for such a test. Among those who appealed for relief was Mr. Vosberg, of New York, who presented a letter from Mr. Fisher, of the Lehigh Valley Railroad Company.

The rapid rise in Bessemer pig and in steel, and the scarcity of ore suitable in quality, has given rise to numerous hints that the term Bessemer pig is now and will in the near future prove a very elastic term. We have not yet heard of any well authenticated cases in which iron containing an excess of phosphorus has been tendered as Bessemer pig. It is hinted, however, that the steel mills are not likely to be very critical now.

The Mitis Wrought Iron Casting Company, of Neponset, Mass., have issued a new circular relating to the castings which they manufacture.

Bids for Gunboats, &c

Bids were opened at the Navy Department on the 22d inst. for the construction of three new vessels for the navy—two 1000-ton gunboats and one 800-ton practice vessel for the naval academy. The appropriations for these three vessels aggregate $960,000, of which not more than $700,000 can be expended for the gunboats and $260,000 for the practice vessel. This provision will enable the department to accept any two bids of whatever sums each for the gunboats—so that the aggregate amount does not exceed $700,000. In the advertisements for the vessels it was announced, as usual, the bidders might take their choice of four classes of proposals: Class 1 is for the vessel, according to the plans of the department, including both hull and machinery; class 2 is for plans of the contractor entire; class 3 is for the vessel, according to the plans of the department, for the hull, and those of the contractor for the machinery; class 4 is the reverse of class 3. The payments on all the vessels are to be made in 20 equal installments as the work progresses. The bids were as follows: The Bath Iron Works, Bath, Me.: Class 1, one gunboat, $327,000: two gunboats, $637,000, being $313,500 each. The Atlantic Iron Works, of Boston, Mass.: Class 1, one gunboat, $344,000; or class 2, one gunboat, $344,000. The bid of the Samuel E. Moore & Sons Company, of Elizabeth, N. J., was withdrawn.



Balanced Spindle Drill.—Front View Showing Drilling Spindle in Horizontal Position.

In Allentown, Pa., a jury returned a verdict for defendants in the case of the Catasauqua Mfg. Company, who sued to recover $18,000 from Burgess, Storm & Hopkins for alleged fraudulent charges for scrap iron.

THE BETHLEHEM IRON WORKS.

DESCRIPTION OF THE PLANT.*

BY W. H. JAQUES (LATE U. S. NAVY).

Less than three years ago the Bethlehem Iron Company broke ground to carry out the writer's proposition for the introduction and erection of complete hydraulic forging machinery for the manufacture of the largest guns and the heaviest shafting and armor plates; to erect a plant long needed in the United States, to make the country independent in the possession of the means of supplying the nation with the most powerful guns and equipping her ships with the most efficient shafting and armor. The company that undertook this great work was conceived as early as the year 1857, when the senior partner of the firm of A. Wolle & Co., of Bethlehem, procured a charter dated April 8, 1857, for a company styled "The Saucona Iron Company." By an act of legislature dated March 31, 1859, the corporate title of the company was changed into that of The Bethlehem Rolling Mills and Iron Company, and the services of John Fritz, of Johnstown, Cambria County, Pa., were secured to superintend the construction of the works and the subsequent manufacture and production.

Their first board of directors, chosen June 14, 1860, was composed as follows; President, Alfred Hunt, of Philadelphia. Directors, Augustus Wolle, of Bethlehem; Asa Packer, of Mauch Chunk; John Knecht, of Shimersville; John Taylor Johnston, of Central Railroad of New Jersey; Charles B. Daniel, of Bethlehem; Charles W. Rauch, of Bethlehem; secretary and treasurer, Charles B. Daniel. The present board consists of John Knecht, of Shimersville; Robert H. Sayre, of South Bethlehem; Joseph Wharton, of Philadelphia; E. P. Wilbur, of South Bethlehem; W. W. Thurston, of South Bethlehem; Robert P. Linderman, of South Bethlehem; George H. Myers, of South Bethlehem. The officers are: President, W. W. Thurston; vice-president, Robert P. Linderman; general manager, Robert H. Sayre; chief engineer and general superintendent, John Fritz; assistant superintendent, R. W. Davenport; secretary, Abraham S. Schropp; treasurer, C. O. Brunner.

These works are situated at South Bethlehem, Northampton County, Pa., on the Lehigh river, 87 miles from New York by way of the Lehigh Valley Railroad and Central Railroad of New Jersey, and 55 miles from Philadelphia by the North Pennsylvania branch of the Philadelphia and Reading Railroad. They are connected with the anthracite coal regions by the Lehigh Valley and other railroads, various roads and their connections affording ample facilities for the cheap transportation of fuel and ores to the works and convenient outlets for the distribution of the varied products. At the present time the works consist of offices, boiler houses, blast furnaces, puddle mill, merchant steel mill, Bessemer department, department of construction and repairs, ordnance and armor plate department, laboratories, mines, quarries, &c. The buildings have been erected from designs made here. They are of hard gray sandstone from adjacent quarries and brick, and the roofs, covering about 18 acres, are of slate from the vicinity.

Offices.—The offices are roomy, well lighted and equipped with modern appliances and well-lighted drafting rooms.

Boiler Houses.—The boiler houses are detached and conveniently arranged for the delivery of fuel and the boiler settings peculiar, to provide for expansion in any direction without subjecting the boilers to any injurious strains.

Blast Furnaces.—No. 1 furnace was commenced in 1860 and completed and put in blast in January of 1863; No. 2 was completed in 1867; in 1868 the furnace of the Northampton Iron Company was purchased and put in blast during December of that year under the name of No. 3, and after running 16 years was dismantled; furnaces Nos. 4 and 5 were put in blast in March, 1876, and March, 1877, respectively; furnace No. 6 was completed in 1883; furnace No. 7, purchased in 1879, is situated at Bingen, on the Philadelphia and Reading Railroad, about six miles from Bethlehem.

Furnace.	Hight.	Bosh.	Hearth. Feet.	Hearth. In.
No. 1	61	15⅛	8	6
No. 2	70	16	10	0
No. 4	70	16	10	0
No. 5	70	16	10	0
No. 6	70	19	10	0
No. 7	65	16	10	0

These furnaces are widely known for their excellent Bessemer iron. The fuel used in smelting is anthracite coal from the upper Lehigh region, with a mixture of Connellsville coke. A choice variety of hematite and magnetic ores from the most celebrated mines at home and abroad allows of an excellent pig for making Bessemer and open-hearth steels of a very superior quality. A railway connects the furnaces with the converters for the transportation of fluid metal, thus permitting the making of Bessemer steel by the direct process. The total annual capacity is 160,000 tons.

The engine house, separated from the furnaces by the stock house, is a massive stone building 60 x 327 feet, erected with the special view of protecting the blowing machinery from the dust and dirt of the furnaces. It contains seven horizontal blowing engines, five of which are compound; steam-cylinders, high pressure, 30 inches diameter, low pressure, 54 inches diameter, 80 inches stroke; blowing cylinder, 80 x 80 inches. The other two engines are single condensing; steam-cylinder, 54 x 80 inches, blowing cylinder, 80 x 80 inches.

The blowing engines of the horizontal compound type work at a high speed and under high pressure of blast with a degree of smoothness and noiselessness that is rarely observed in a blowing engine. A strong feature in these engines and one now generally recognized by blast-furnace engineers, is their capacity of blowing as high a pressure as 20 pounds of air, this pressure sometimes being necessary to save the furnace and obviate expensive delays. The cast house of each furnace is at a right angle and forms a wing to the stock house. The spaces intervening between the cast houses are used for cinder yards on one side, while on the other are located the boilers and hot-blast stoves. The newest furnaces are provided, each with three Whitwell fire-brick regenerative stoves, which give excellent economical results. These stoves are 20 feet exterior diameter and 60 feet high. The stock house is common to all the furnaces, and is a continuous building, running parallel with the line of furnaces and to their full extent. It is 61 feet wide. A double track runs the length of the building on trestles 12 feet above the floor level. The floor is divided off into spaces on each side and a central aisle renders all parts accessible.

The Puddle Mill.—This mill contains three double double, four double and one single puddling furnace, with boilers over furnaces. It was originally built for the production of iron rails, and since they have no longer been in use has been noted for the high quality of merchant iron and muck bar produced. The mill has recently been used for the production of muck bar exceedingly low in phosphorus, which is used for remelting at the open-hearth furnaces for the production of the high quality of steel necessary for ordnance and shafting work.

Merchant-Steel Mill.—The merchant-steel mill is principally used for the rolling of smaller sections of rails, and special grades of Bessemer steel into billets, which are sold to manufacturers for the production of merchant bar, wire-rods, axles, &c. The rolling of iron shapes, principally used for construction in the works, is an important product of this mill.

Bessemer Department.—This mill is a large and massive stone structure, having numerous and uniform arched openings in its sides, and an iron and slate roof with a continuous lantern. The total length of the nave is 1512 feet, and its width is 111 feet. The transepts are also 111 feet wide, and their total length, including the crossing of the nave, is 386 feet. The clear hight is 29 feet. This building runs longitudinally east and west, parallel with the Lehigh Valley Railroad. In the western or upper portion of the mill is located the converting department, consisting of four 7-ton vessels. These vessels are arranged in a straight line across the mill, an iron platform supported on cast-iron columns surrounding them. Back of the vessels stand the iron and spiegel cupolas; they are supplied with double platforms, one above the other, commonly called the charging and tapping floors. These floors communicate with the vessel platform and with each other by means of iron stairs. Three vessels are worked alternately, while one is off for repairs; the iron cupolas are run four on and four off; the spiegel cupolas are run two on and two off. This method of working facilitates repairs and prevents the necessity of any excessive repairing or protracted delays. The vessels are wrought iron shells, 8 feet in diameter; the body is completely lined with natural stones of mica schist, roughly hewn to shape, and the nose is lined with fire-brick.

A vast number of experiments were tried before a natural stone could be found that would not either flake off under the heat of glazing or become rapidly denuded. The excellence of this stone depends upon its mechanical structure, which of course is a thing hardly capable of description. Excepting some not expensive repairs to the nose, one of these linings is good for 30,000 tons of ingots. In the old plant, 54,000 tons were made on the linings of the two vessels without the removal of any stones excepting in the nose and a few at the bottom joint. The vessel bottoms have 17 fire-brick tuyers, with 12 holes, ⅜ inch each. Between the tuyers are set on end bricks like the blast-furnace lining brick, as near together as they will stand. The small space left between the bricks and tuyers is rammed with ordinary gannister bottom stuff, and so small is the total quantity of water in the bottom that it needs oven-drying only four hours; the bottoms stand 12 to 14 heats quite uniformly. The output of the converting department averages 4000 tons of ingots per week of 11 shifts; the plant has been worked at a higher rate of production. The annual capacity is 225,000 tons. The heats of ingots run from 7 to 8 tons according to the weight of rail. Fourteen-inch ingots are bloomed down to 7 inches square, and cut into single and double rail blooms for the rail mill. The stock ladles, molten metal, ingots, &c., are moved by a system of narrow-gauge tracks. This system, by means of frequent turn-tables, switches and hydraulic lifts, offers a complete and convenient conveyance. The casting pits and handling floor are under complete command with a systematic arrangement of hydraulic cranes.

* Proceedings of the United States Naval Institute, Vol. XV, No. 4.

The blowing machinery is located in the upper transept, next the railroad. There are two Bessemer blowing engines of the following dimensions: The smaller has two steam cylinders 36 x 60 inches, coupled direct with two blowing tubs 48 x 60 inches. The blowing tubs are placed back of the steam cylinders and on the same bed plate; the steam cylinders are coupled on their forward end through cross heads and connecting rods to a fly-wheel shaft, whose cranks stand at right angles. The larger engine has two steam cylinders 56 x 66 inches, and two blowing tubs 60 x 66 inches, arranged like the smaller. The smaller was the original engine, but, proving inadequate to the demands of the increased plant, it has been replaced by one more powerful, and is now used as a reserve or emergency engine. The large blowing engine running with 50 pounds of steam is capable of maintaining a blast pressure of 40 pounds of air. The cupola blast is obtained from four No. 7½ Baker blowers, coupled direct to the shaft of a compound engine running 90 revolutions.

The blast pressure at the blowers is about 1½ pounds, and 11 ounces at the tuyers. Another compound engine directly coupled with four blowing tubs is kept in reserve for the cupolas. A Worthington duplex and two Worthington compound duplex pumps are also located in this transept and supply a water pressure of 300 pounds to the square inch for the operation of cranes, hoists, &c. In the opposite transept are two Pernot furnaces, with their accompaniment. Just outside this transept is the ladle-house, supplied with a number of short tracks and turntables. The freshly-lined ladles are placed on cars and run into position on these tracks; when in position a cap is lowered, forming a combustion chamber of the ladle, and a stream of gas and air, in regulated proportions, admitted through the center of the cap, causes more rapid drying and hotter ladles than could be obtained by the old method of building fires in them. The number of ladles required is considerably reduced by this method.

The vessel-bottom repair shop is located in the upper end of the mill, and is furnished with hydraulic cranes for handling and ovens for drying. At this end of the mill a brick foundry has been erected on the south side and adjoins the mill. This foundry is used for the manufacture of ingot molds, the consumption being six to eight per day. The equipment consists of a cupola and two power cranes. In the main portion of the mill, just below the pits and handling floor, are six Siemens reheating furnaces. Three furnaces are placed on each side, with hydraulic cranes for charging and drawing the ingots. Centrally, between these furnaces and under command of the hydraulic cranes, run two narrow-gauge tracks, one running to the casting pits, the other to the blooming train. There are two blooming mills, two engines and three sets of rolls. The smaller engine is 36 x 60 inches, coupled direct to two sets of three-high 32-inch rolls. Both sets are supplied with tables operated by power and controlled by two levers at one point. The large mill is also three high; the rolls are 48 inches diameter and 10 feet long; the engine is 65 inches by 8 feet, with 90-ton fly-wheel; this mill is similar to the smaller, but handles a larger ingot. From the blooming mill the ingot passes to steam hammers, is cut into rail blooms and charged into the rail-mill heating furnaces.

These furnaces (four in number) are similar in construction to the blooming-mill furnaces, varying only in size, and are located immediately below the blooming mill. The rail mill consists of three sets of rolls; the engine is an upright compound, 36-inch high pressure and 56-inch low pressure cylinders, 50-inch stroke; the rolls are 24 inches, three high. The rail passes from the rolls to the hot saws and thence to automatic hot straighteners, hot beds, cold straighteners, drill presses, and then to a line of driven rollers, which carry the rails to the cars for shipment. A new 28-inch mill rolls heavy sections and long lengths. This train is driven by three high-speed compound engines on one shaft, connected with the middle roll and driving direct The aggregate power of these engines is 8000 horses. The necessary tables are of novel design and are worked automatically by water or air. In the heating furnaces of this department, a gas made from crude petroleum oil is used for fuel at the present time, instead of coal gas made in Siemens producers, as was originally the case.

Department of Construction and Repairs.—This department includes pattern, foundry, machine and smith shops for construction purposes and the necessary repairs.

The machine shop is a stone structure 253 x 64 feet, containing lathes, planers, boring mills, gear-cutter, drill presses, shapers, slotting and straightening machines and pipe cutters, among which are the 120-inch planer, a 16 foot boring mill, three heavy lathes and two large universal drills—one having a span of 14 feet.

The foundry, also of stone, is 107 feet x 64 feet and forms an L with the machine shop. It is supplied with two cupolas and three powerful cranes, and is thoroughly equipped for all the necessary work.

Ordnance and Armor-Plate Department.—This department, now in operation, when completed, will comprise gas producers, open-hearth furnaces, fluid-compression apparatus, soaking pits, hydraulic forging presses, plate-rolling mill, crucible furnaces, hydraulic and pneumatic cranes, a 125-ton single acting steam hammer, bending press, oil-treating and annealing shops and machine shop. The open-hearth furnaces will have a capacity for casting ingots of 100 tons. The hydraulic forging presses will produce the largest forgings required for ships of any tonnage thus far designed, and for guns of the largest caliber now in existence. A specialty will be made of hollow forgings of large dimensions. The plate-rolling mill will be capable of supplying all probable demands for rolled plates of every description. The pneumatic and hydraulic cranes have a capacity of from 25 to 150 tons. The building containing the open-hearth furnaces, forging presses, fluid-compression apparatus and plate mill is 1155 feet long by 111 feet wide, with transept and annexes for engines, gas producers, &c. The oil-treating and annealing shops are conveniently arranged for economical treatment of heavy gun and other forgings and of armor plates.

The machine shop contains lathes, planers, boring mills, slotters, drilling machines, shapers, &c. Among these are a planer in which 13 x 13 feet by 50 feet 10 inches can be planed; 10-foot face-plate lathe; boring mills of the most recent design, and some of the most powerful lathes in existence. The building is 641 feet in length by 116 feet in width. The traveling cranes are of the pneumatic type, 60 feet span, and from 25 to 100 tons capacity. The shops are well lighted by electricity, and the entire plant supplied with efficient rail communication and adequate rolling stock. The casting and forging presses were manufactured by Sir Joseph Whitworth & Co., of Manchester, England, and designed by Mr. Gledhill, managing director of that firm; the heavy tools were constructed from designs by Mr. Gledhill and Mr. Fritz; and all erected under the latter's direction

In the designing and erection of the hammer plants for making armor plates, the plans of Schneider & Co., of Creusot, France, were consulted and followed as far as they met the conditions of construction already adopted. This department, for the production of heavy forgings for guns, armor, shafting and other purposes, is rapidly approaching completion, and within a year will equal if not surpass, any other establishment of its kind in the world in its capacity to supply war material, and the perfectness of its means of rapidly producing the heavy forgings required for modern high-power ordnance and the most powerful armored ships yet designed. With a casting capacity for ingots of 100 tons, fluid compression plant, a steam hammer of 125 tons (falling weight), the most powerful hydraulic forging presses ever constructed, and tools of the most approved and advanced type for shaping and finishing, this company has already manufactured and delivered all of the heavy shafting of the cruisers Philadelphia, San Francisco and Newark, together with forgings for 4-inch, 6-inch, 8 inch and 10-inch breech-loading rifles, and is now engaged upon the shafting of the armored coast-defense vessel Maine, and 8-inch, 10-inch and 12-inch breech-loading rifles for both the army and navy, and the armor of the barbette battleship Puritan, the double-turreted monitors Amphitrite, Monadnock and Terror, the battleship Texas and the armored cruiser Maine. In addition to the war material (including hollow and other forgings for shafting, guns, armor, shields and conning towers), special and miscellaneous forgings, the works have an output of some 250,000 tons of rails, blooms and billets and miscellaneous work under a *personnel* of about 3000.

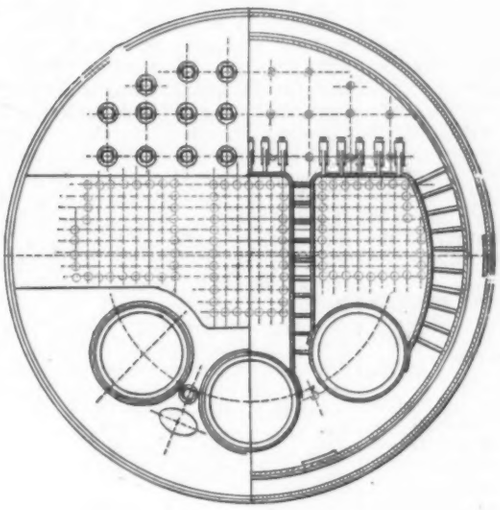
The chemical and physical laboratories are very complete and contain Riehle and Emery testing machines of 100,000 and 300,000 pounds capacity. The company's property at South Bethlehem covers an extent of about one and a quarter miles in length by one-quarter of a mile in width, of which about 18 acres are under cover.

In the *Comptes Rendus*, of the French Academy of Sciences, for December 9, M. Angot has published an interesting paper on "The Observations of Temperature at the top of the Eiffel Tower." The mean monthly maxima and minima for July to November, inclusive, are compared with those recorded at the Parc Saint-maur. According to the usual decrease of temperature with hight, the Tower observations should be about 2.9° lower than at the ground station, but the difference is much greater in summer during the day, and much less in winter during the night. In calm and clear nights, especially, the temperature has been found to be nearly 11° higher at the summit than at the base. At the time of a change of atmospheric conditions the change is manifested some hours, or even days, at the higher station. A striking instance of this occurred in November. After a period of high pressure, with calms and easterly breezes, the wind on the surface became strong, and shifted to south-southwest, and temperature rose. But the change had manifested itself on the Tower on the evening of the 21st, and during the whole period, from the evening of the 21st to the morning of the 24th, the temperature at the Tower was higher than at the base, at some times even exceeding 18°. *Nature* says: "Observations made by a swinging thermometer at 11 a. m. on the 22d showed that the inferior limit of the warm current was approximately between 500 feet and 600 feet above the ground."

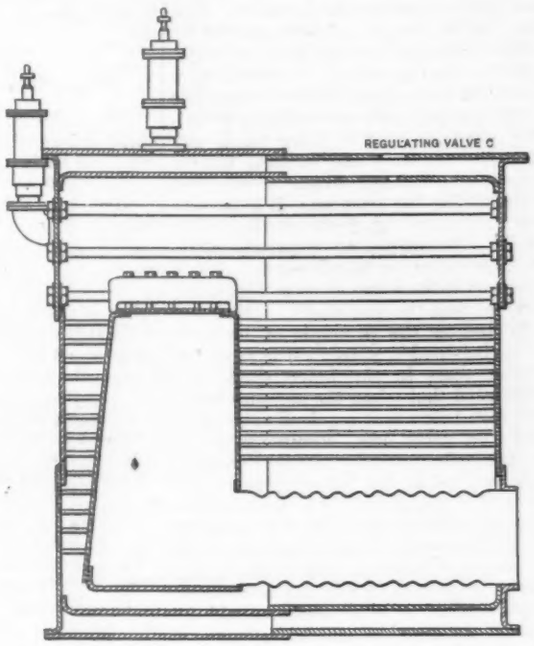
As the result of a study of the replacements under guarantees ranging between five and ten years, on the Links Rheinische railroad, Baurath Ruappell, of Cologne, draws the conclusion that in Germany steel rails have been improved in quality.

Marine Boiler for Higher Pressures.

The last four or five years have seen a marked extension of triple-expansion engines working at pressures from 125 to 200 pounds to the square inch. This type of engine has been almost exclusively adopted in recent marine work, and, together with the quadruple expansion, has called for extremely high-boiler pressures, since the economical results produced by these engines depend largely and in a certain sense, are dependent upon the employment of pressures which ten years ago would have been deemed preposterous. The superiority of these engines is due to the high rate of expansion made possible by the high pressures of steam employed, which avoid in a great measure excessive variations of temperature in the cylinder, great initial strains and sudden "drops" in the receivers. Further, as an increased pressure is obtained by only a slight addition in the consumption of fuel, the efficiency of the engine rapidly increased. From a paper read before the Northeast Coast Institution of Engineers and Shipbuilders by Charles Bastow Casebourne we take the following abstract and illustrations, showing a new form of marine boiler especially adapted to higher pressures and which introduces the more or less well known double-shell principle. We may add, in parenthesis, that a boiler of somewhat similar form, and at all events founded upon the same principle of construction, is now being introduced in this country:



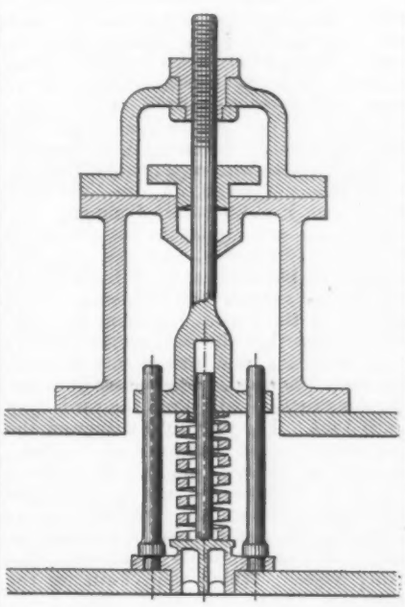
End Elevation Half in Section.



Longitudinal Section.

MARINE BOILER FOR HIGHER PRESSURES.

At the present time quadruple expansion engines are working at a pressure of 180 pounds only. This is accounted for by the fact that hitherto it has not been found possible to construct a marine boiler capable of withstanding a higher pressure without either considerably reducing the diameter or increasing the thickness of the shell plates. With respect to the reduction of the diameter, it may not be generally known that boilers of the locomotive type have frequently been tried, and many engineers are looking to this class of boiler as offering some advantages in point of weight in comparison to marine boilers, as well as their adaptability for higher pressures. Their performances have, however, not been found satisfactory, and in many instances where large boilers of this type have been in use they have had to be taken out and replaced by the ordinary type of marine boiler. Two of the principal objections to the locomotive boiler for marine purposes are; 1. That they require the purest of water, as from their construction they are much more difficult to clean and scale more than an ordinary marine boiler. 2. They are apt to prime owing to the small diameter and limited steam space, whenever the vessel is rolling and pitching in a sea way. Again, the writer questions very much whether this type of boiler, if required for a certain horse-power, could be made to occupy the same space of boiler room as a marine boiler of the same horse-power.



Section Regulating Valve.

In a paper read before the Institution of Naval Architects by Mr. W. Parker, March 27, 1885, he says: "I have conferred with the principal steel makers in the kingdom on this subject, and am able to say that they agree with me, and are decidedly of the opinion that steel shell plates of over an inch in thickness and having a tenacity of over 30 tons must contain so much carbon as to render them unsuitable for boiler-making purposes, although they may possess the necessary tenacity and ductility to withstand the usual tensile and cold bending tests." Since this paper was read the uniform quality of steel plates for boiler making has considerably improved, and they are now able to turn out plates up to 1¼ inch and 1⅜ inch thick, but this is about the limit. Mr. J. T. Milton also remarks, in a paper read before the same institution March 30, 1882: "That these pressures of 140 pounds and 180 pounds are not likely to be increased for some time to come, unless some type of boiler is introduced which will not necessitate the present style of casing for containing the steam and water, nor the present method of internal firing, as with the obtaining pressures the thickness of plates for these portions have reached the maximum capable of being worked on the one hand and of being used for the transmission of heat on the other." Taking these matters into consideration it would appear that before higher pressures can be adopted some improved type of boiler is necessary to withstand these higher pressures, which must be so constructed that shell plates of excessive thickness are not required nor has the diameter of boiler to be reduced.

Having regard to these requirements the writer ventures to introduce to your notice a form of boiler which will bear the strain of these higher pressures without increasing the thickness of shell plates or reducing the diameter. In the accompanying illustrations Figs. 1 and 2 represent views of a boiler having two shells, which will hereafter be named as "outer" and "inner" shells. The space inclosed between the shells is termed a "jacket," so that the whole may be termed a "jacketed" boiler. The object of providing a double shell is to charge the inclosed space with steam of a lower temperature than that generated within the inner shell,

which is thus relieved of the full pressure of steam within, and is only subjected to the excess of the pressure of steam within over the pressure of the steam between the two shells. As, for example, in the illustrations we have a boiler with a shell calculated to stand a working pressure of 150 pounds to the square inch, employed as the inner shell of a boiler in which steam is generated to a working pressure of 250 pounds, the extra 100 pounds being neutralized or balanced by an external pressure of the same amount exerted by the steam inclosed between the two shells or jacket. As the object of providing a space between the two shells is to provide a means of applying a neutralizing or balancing pressure to the inner shell, any fluid or gaseous body may be used, but for many obvious reasons steam is the most convenient for the purpose. It is at once evident that the pressure in the jacket must be constantly and regularly maintained, and in order to provide for this it is necessary to have one or more regulating valves between the two shells. These are constructed on the principle of an ordinary spring-loaded safety valve mounted on valve seats in the inner shell, and so regulated that when the pressure in the jacket falls below that required to be maintained the valve lifts, admitting steam from the boiler until the required pressure is reached, when the valve again closes. The valve is loaded to 150 pounds, and is externally adjustable. This is effected by having a screwed spindle passing through the cover by means of which the spring may be compressed or released as desired. A valve similar to that shown would be necessary to provide against collapse of inner shell, should the pressure in boiler from any cause be suddenly reduced. Safety-valves of ordinary construction would have to be provided for both boiler and jacket. Condensed water would be drawn away from bottom of jacket to feed pumps. Tubes would have to be thicker, but not much more so than those required for 150 pounds pressure, as their diameter could be slightly reduced. The same may be said of furnaces. These could be used of a thickness of $\frac{5}{8}$ inch and diameter of 3 feet, and a thickness of $\frac{9}{16}$ inch and diameter of 2 feet 6 inches, of Fox's patent corrugated type. Longitudinal stays would have to be pitched closer together and of rather larger diameter, but they need not be of less pitch than 14 inches, which would afford ample room for examination and cleaning inside of boiler. Combustion-chamber stays would have to be pitched closer together and of rather larger diameter. Tube plates need not be of any excessive thickness, if more screwed stay-tubes are put in. In fact, there seems to have been plenty of room for adapting the present style of marine boiler to higher pressures in all directions with the exception of the shell, and the writer is of opinion that a double form of shell, as shown would overcome this difficulty. Although a boiler with two shells will naturally weigh more than a boiler with one, yet the extra weight will not be so much as might at first be supposed, for by using steam of higher pressure a boiler of smaller diameter is possible, the weight of water evaporated being less. In this boiler there are two forms of riveted circumferential seams employed—one the ordinary lapped joint double riveted, and the other a flanged joint flanged externally in the case of the "outer" shell internally in the case of the "inner" shell. The latter form of joint has been suggested in event of any difficulty being experienced in repairing any ordinary lap joint should occasion rise. It has been previously mentioned that this type of boiler is specially adaptable for steam of 250lb for quadruple expansion engines which are at present only using steam of 180lb. This class of engine is becoming more popular every day, and may in time supersede the present triple expansion, even as the latter has taken the place of compound engines. The writer has not thought it necessary in this paper to go into all the minor details of a new design of boiler, but is anxious to have an expression of opinion from the engineering members of the Institution as to the feasibility of constructing a marine boiler with a double shell to stand much higher pressure than those now in actual use.

Shipbuilding on the Delaware.

The Philadelphia *Record* reports that the shipbuilders of the Delaware River turned out from their yards last year no less than $10,000,000 worth of vessels. These included war ships, large passenger and freight steamships, sailing vessels, tugs, yachts and a host of smaller craft. Great as was the work done on these vessels, however, it did not represent the entire labor of the shipyards, as many vessels remain still unfinished. As nearly as can be ascertained the value of the output of the leading builders was about as follows:

Delaware River Iron Shipbuilding Works, of Chester (Roach's yard)	$3,625,000
Cramp & Sons	3,125,000
Neafie & Levy	700,000
Harlan & Hollingsworth Company, of Wilmington (estimated)	400,000
Pusey & Jones Company, of Wilmington	500,000
John H. Dialogue, of Camden	500,000
Birely, Hillman & Streaker	175,000
Other builders	250,000

The year 1889 was undoubtedly the best the shipyards of the Delaware have enjoyed for a long time. All the indications point to equal prosperity for the present year, as many of the yards have large contracts on hand which it will take them some time to complete.

Ten vessels were constructed at Roach's yard, the highest record of which is 12 vessels. When the value of the output is considered, however, the work of the past year was as great as that of any previous year. The gunboats Concord and Bennington, for the United States Navy, were practically completed, and the others were the steamships Leona, for the Mallory Line; the Kansas City, for the Ocean Steamship Company; the Yumuri, Orizaba and Yucatan, for the New York and Cuban Mail Steamship Company; the Segurancia and Vigilancia, for the Brazil Steamship Company, and the steamer Plymouth, for the Fall River Line. These vessels will average 3000 tons each. Some are still at the yard. President John B. Roach says that the outlook for 1890 is very promising, and that plenty of work has been promised. The vessels now under construction will keep the yard busy until June. The year 1889 witnessed the completion at the Cramps' yard, in Philadelphia, of the most notable war ships that have been built for the new navy. These were the Baltimore, the dynamite cruiser Vesuvius, the fastest vessel of her tonnage afloat, and the gunboat Yorktown. The other vessels, which were built for the merchant marine, were the Caracas, Venezuela and El Mar. The record for the year, as indicated by horse-power and tonnage, was as follows:

Vessel.	Horse-power.	Tonnage.
Baltimore	10,064	4,400
Yorktown	3,398	1,700
Vesuvius	4,280	810
Caracas	1,800	2,584
Venezuela	1,800	2,842
El Mar	2,400	3,531
Total	23,742	15,867

The Cramps still have in their yard the cruisers Philadelphia and Newark, of about the same size as the Baltimore, and some other vessels, which will give them plenty of work for months to come. The present year promises to be even more prosperous than 1889.

The vessels turned out during the year by Neafie & Levy were, among others, the steamer Charlotte, for the York River Steamboat Company, valued at $275,000; the steamer Carona, for the Oregon Navigation Company, $300,000; the tugs Brinton and Media, for the Pennsylvania Railroad, $60,000; the tug A. Hughes, $30,000; the tug International, Peter Wright & Son; the tug Harold, F. Chappel, New London, Conn.; the tug Sculley, John Sculley, New York; the steamer Mendell, United States Government, and the tug Baker, H. G. Burleigh.

The output of the Harlan & Hollingsworth Company consisted principally of tugs, transfer steamers and ferryboats.

At the Wilmington yard of the Pusey & Jones Company 12 vessels, valued at $500,000, were constructed. These were the steamer Lot M. Morrill, the tug Newport, for the Pennsylvania Railroad; the tug Compton, for use on the Cape Fear River, in North Carolina; the steamers Louis Pasteur, Robert Koch and William H. Welsh, for the United States Marine Hospital Service; the steamer Sebastian, for passenger traffic on the Indian River, Florida; the steamer St. Augustine, for the Jacksonville, Tampa and Key West Railway Company, and the steamers Guanare, Socarro and Chimbo, for river service in Venezuela and Ecuador. These three last vessels were built in sections for greater ease of transportation. Mr. Pusey, of the firm, reports that the work done in 1889 was greater than in 1888, and that there is a constant increase. The present year promises to be a prosperous one. The greater part of the firm's work is the construction of heavy engines and machinery, which are sent to all parts of the world.

John Dialogue built seven vessels, mostly tugs, at his Camden yard, the aggregate value of which was $500,000. They were the Louis Luckenback, an iron seagoing tug; the Western Union, an iron cable boat, used by the Western Union Telegraph Company at New York in laying and repairing cables; the Armeria, a steel supply vessel for the use of the Government along the Atlantic and Gulf coasts; the Nathaniel P. Doane, a tug for use in Boston harbor; the George W. Pride, a seagoing tug; the Pocahontas, an iron steamer for the lumber service; the steamer I. J. Merritt, a wrecking boat, and the William P. Congdon, an iron tug owned at Georgetown, S. C.

"Last year was the best we ever had," Mr. Dialogue says, "and the outlook for 1890 is excellent, promising as much work as in 1889, if not more."

Birely, Hillman & Streaker built the following vessels: The tug Bismarck, for use in Boston harbor; a tug for the Susquehanna Boom Company; the steamship Maracaibo, to carry freight between South American ports and New York; the steamer Yuma, for William P. Clyde & Co., for freight service between Philadelphia and New York; the steamer Elko, for the same trade; the tug Rose Hagan, for use in Delaware River, and tug Frank W. Munn, for the Delaware River service. Mr. Hillman, of the firm, states that while 1889 was a fairly good one the prospects for 1890 are flattering, there being many new inquiries for vessels. At present the firm are building a steamship for William P. Clyde & Co. and a tug for Richard G. Banks, for use on the Delaware River. In addition to the firms here named, there are a number of others along the Delaware River, the value of whose output must have been large. Taking all the yards together, it may safely be said that they turned out $10,000,000 worth of vessels. These figures go to show that the Delaware still retains its pre-eminence as the Clyde of America, and that its ship-building industry is on the high wave of prosperity.

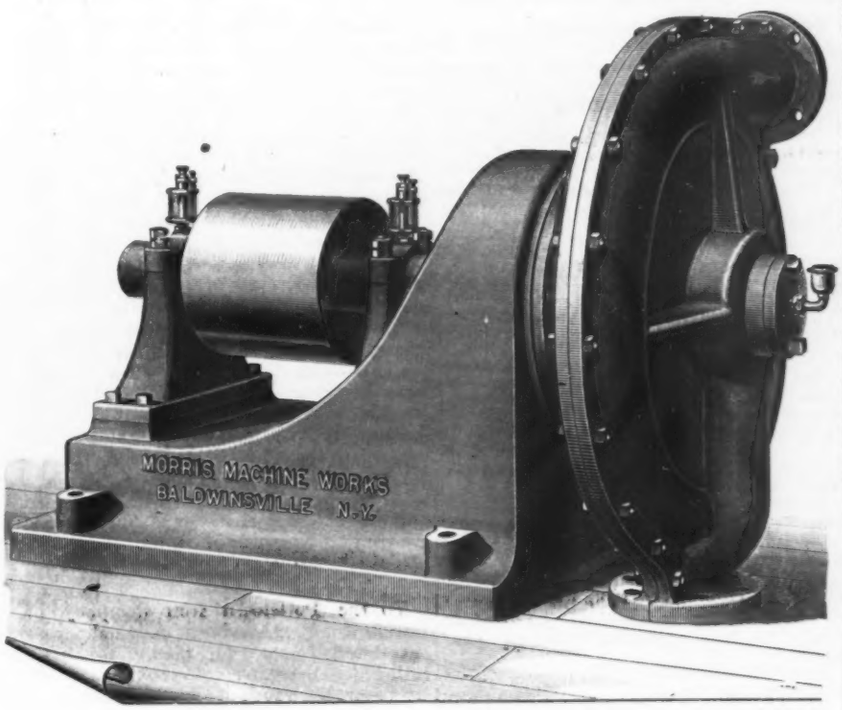
Building the New Navy.

The Senate Committee on Naval Affairs gave an extended discussion to the recommendations of the Naval Policy Board appointed by Secretary Tracy. The recommendations include one that great line-of-battle ships like the English Benbow should be constructed at once. The policy in substance involves the construction of 227 ships, with a total tonnage of 610,035, at a cost of $349,515,000. This aggregate cost includes $67,965,000 already expended. When the committee proceeded to the consideration of these recommendations the issue was raised as to whether or not it would be advisable at this time to begin with the construction of the immense line-of-battle ships as proposed by the Policy Board. Including the harbor defense monitors there are 44 of these vessels and they would cost $202,490,000, while the other 183 vessels, including 101 torpedo-boats at an aggregate cost of $6,565,000, would cost only $147,025,000. The maintenance of these heavy vessels would also be considerable. It was proposed to construct them in order that we might have an offensive fighting fleet capable of contending with the greatest fleet of any foreign power.

Senators Chandler and McPherson opposed that part of the Policy Board's recommendations proposing that these vessels should first be constructed. They said that in their opinion the United States should continue its present policy of building fast cruisers like the Baltimore, Boston, Charleston and San Francisco, and gunboats and torpedo vessels. The cost of these vessels was comparatively small, and they would form an unequalled fleet of commerce destroyers. The building of the huge line-of-battle ships should be deferred until we had a larger number of cruisers or there was some exigency calling for their construction. They hoped the committee would begin with the latter and not the first half of the vessels recommended to be constructed. On this issue the committee divided, the majority agreeing with the Policy Board. In accordance with this decision Senator Hale was instructed to report favorably the bill introduced by him some days ago embodying the recommendations contained in Secretary Tracy's annual report.

Double Suction Pump.

The general form and arrangement of the parts of this pump, which is built by the Morris Machine Works, of Baldwinsville, N. Y., manufacturers of special pumps for hydraulic, dredging, irrigation and drainage work, are clearly shown in the accompanying engraving. A wide-face driving pulley is mounted at one end of the shaft, which at the other end carries the blocks of the pump proper. The case of the pump is formed of two parts only, which are flanged and bolted together, the inner-half being also flanged and bolted to the bed, the form of which is shown in the cut. The many advantages arising from this form of construction are apparent. Among the claims made for this pump by the makers are that it is heavier, more efficient and better made than any heretofore produced.



DOUBLE SUCTION PUMP.

The Duluth Iron and Steel Company have commenced the work of putting up the incline plane which is being constructed by the Berlin Iron Bridge Company, Berlin, Conn. It is about 400 feet long, running from the stock-house on the ground level to the top of the furnace stack, about 95 feet high. The structure is capable of sustaining a load of 15,000 pounds while going at the rate of 300 feet per minute, and is guaranteed against any collapse of the loaded car, also against any wind pressure. The same company have the contract for putting up a boiler-house over a battery of 16 boilers. It is to be constructed entirely of iron, iron posts and trusses, and the top and sides are to be covered with corrugated iron. The firm of Best, Fox & Co., of Pittsburgh, Pa., have the contract for all material, doing the work for supplying the plant with water. The water supply consists of two Barr pumps, each with a capacity of 1,500,000 gallons a day.

Copper in Steel.

An apt illustration of the fact that better knowledge dispels some of the prejudices of the earlier days is furnished by the manner in which the presence of copper in steel is now regarded. It is not too much to say that the pioneer work done in this direction by one of the Eastern rail mills is destined to retain to Eastern Pennsylvania a position in the iron trade which otherwise would have been imperiled by the invasions of Western makers. Very little has reached the public of the prolonged struggle on the question whether or not copper in steel is injurious to it. To-day some of the leading consumers of rails, after an investigation quietly carried out, have overcome their prejudice and freely acknowledge that the presence of copper in steel not alone is not hurtful, but that it is probably the cause of recognized and admitted superiority in quality.

Some of the great metallurgists of Europe seem to have reached the same conclusion. Evidence thereof is furnished by the fact that Henri Schneider, of the famous Creusot works in France, has lately taken out patents in this country for the process of manufacturing alloys of iron and copper. M. Schneider's plan is first to produce an alloy of cast iron and copper, and subsequently to use the alloy so manufactured to introduce a given amount of copper into crucible of open hearth steels. We quote from his patents as follows: "It has long been known from laboratory experiments that copper imparts to iron and steel, when added thereto in the proper proportions, certain valuable properties; but no practical industrial method of combining these metals in the proper proportions has been heretofore discovered, so far as I am aware, and consequently the said alloys are unknown as industrial commodities. Copper cannot be incorporated with iron or steel by direct admixture to form a homogeneous alloy; but I have discovered that this result can be attained by first incorporating the required quantity of copper in a thoroughly-fusible mass (cast iron being the metal employed), throughout which copper is thoroughly diffused, this admixture or alloy being formed in a crucible, cupola, or open-hearth furnace. The copper cast iron alloy may then be used as an ingredient in the manufacture of alloys of iron or steel and copper. In carrying out the present invention the furnace is charged with copper scrap and cast iron mixed between layers of coke, or if a cupreous coke be employed then the cast iron is laid in alternate layers with it, and a layer of anthracite is preferably laid over the whole. The alloy, which is the product of the furnace contains, generally, from 5 to 20 per cent. of copper, according to the purpose for which it is to be employed, and it is remarkable for its great elasticity, strength, tenacity, and malleability—properties which may be still further developed by chilling or tempering.

"This alloy is charged into the bed of a furnace with the ordinary ingredients used in the manufacture of steel, preferably under a layer of anthracite to avoid oxidation. It is important that the copper be introduced at as early a stage in the process as possible. The alloy of cast iron and copper may be introduced either while yet melted or after cooling and hardening; or it may be prepared in the furnace itself, where the operation of manufacturing the steel is carried on. In the latter case the bed of anthracite is first prepared and the copper placed thereon with a suitable quantity of cast or pig iron. The whole is then covered with anthracite in order to protect the metal from contact with the air during fushion. When the charge is melted the excess of anthracite is

removed and successive charges of iron or scrap added, the operation being then continued in the ordinary way, care being taken to continually protect the bath from oxidation by means of a layer of slag or cinder, which may be renewed as required, and also to prevent redshortness in the metal before the final introduction of the recarbonizing and manganiferous silico-spiegel iron or ferro-manganese. The steel produced according to this invention generally contains from about two to four per cent. of copper, this being a sufficient quantity to impart to the metal the qualities of elasticity, strength and malleability to a remarkable extent; but the invention is not limited to these proportions. The steels alloyed with copper are especially useful in the manufacture of ordnance, armor-plates, gun-barrels, projectiles and other military purposes, or in the manufacture of commercial sheets, bars and the like. They may be obtained with varying amounts of carbon, manganese, or silica or silicium, according to the degree of hardness required and the purpose for which they are employed. They may be obtained in the form of ingots, being subsequently forged or rolled, or in the form of castings, and in order to obtain the best results it is preferable to temper them either with water, oil, or otherwise."

We may add that Mr. Schneider has been granted patents also for manufacturing in a smaller way nickel steel, concerning which there have been such favorable reports lately.

A Travesty on Gauges.

A somewhat remarkable circular has been issued recently by the Thompson Mfg. Company, Cleveland, Ohio. As is well known, this company are not members of the National Association of Iron Roofers, but prefer instead to manage their own affairs as to them seems best. The circular which we have described above as a travesty on gauges is as follows :

If you are in the market for corrugated iron or any kind of iron roofing or siding a careful perusal of the statements of this circular will very likely save you some money. How? Because we propose to demonstrate to you by actual figures that very often when our quotations by the square are apparently higher than other quotations a careful comparison shows conclusively that our prices are as low or even lower than any you have.

To commence, please bear in mind that all our quotations on the different gauges are based on standard gauge, and not on Birmingham or American gauges that our competitors use (for tables on the different gauges of iron see page 4 of our illustrated catalogue, 1889 edition). Note also that in corrugated iron our measurements for widths are for covering widths and not extreme widths, as sold by others, also that some firms charge you extra for barbed roofing nails.

Now, we have three comparisons to make. 1. The difference in weight of iron used in the different gauges. 2. The difference in the quantity of square feet between covering widths and extreme widths. 3. The cost of nails where not included in the price per square. Suppose we commence at No. 20 gauge and make our comparisons in detail to No. 28 gauge.

Now, what we sell for No. 20 is 14-100 pound to the square foot flat heavier than No. 20 Birmingham as sold by others.

	Per square.
The difference in weight is	$0.46
The difference in measurements is	.22
Add for nails	.07
Total	$0.75

Our No. 22 is 12-100 pound to the square foot flat heavier than Birmingham No. 22.

	Per square.
The difference in weight is	$0.42
The difference in measurements is	.19
Add for nails	.07
Total	$0.68

Our No. 24 weighs 12-100 pound to the square foot flat more than No. 24 Birmingham.

	Per square.
The difference in weight is	$0.33
The difference in measurements is	.16
Add for nails	.06
Total	$.055

Our No. 26 weighs 8-100 pound to the square foot flat more than No. 26 Birmingham.

	Per square.
The difference in weight is	$0.23
The difference in measurements is	.13
Add for nails	.06
Total	$0.42

Our No. 28 is same weight that our competitors call standard roofing gauge, and what some of them sell for No. 26.

	Per square.
The difference in measurements is	$0.11
Add for nails	.06
Total	$0.17

Now, in figuring the difference in measurements we have used the minimum, but taking the number of sheets and the covering width that some firms sell for a square you can safely add to our difference in measurements 40 to 75 per cent., and we propose to give you a few more facts to prove our assertion. We quote from a late issue of a catalogue sent out to the trade by a roofing company who make a specialty of corrugating iron with superior exactness as follows :

"Rule for estimating on 2½-inch corrugated sheets.

"For Roofing.—Select the most economical of our regular lengths of sheets to cover your rafters (allowing 3 inches end laps, and say 6 inches projection at eaves). Then add the lengths of sheets selected; then multiply their total length by the length of ridge, adding 7 per cent."

Please note that this 7 per cent. is for side laps, and figured out makes the additional cost on measurements as follows :

	Per square.
No. 20 gauge	$0.36
No. 22 gauge	.31
No. 24 gauge	.25
No. 26 gauge	.21
No. 28, or standard roofing gauge	.18

Now, remember that the amounts as shown as the difference in weights and measurements is for black iron painted (galvanized would show a greater difference), and that figures are based on the present price of sheet iron. If the price is higher the difference would be greater. If the price is lower the difference would be less.

To carry our comparisons out on a different line we find in the catalogue of another roofing company the matter stated about as follows:

3 inch corrugation, covering width 24 inches.
2½-inch corrugation, covering width 23 inches.
1¼-inch corrugation, covering width 24 inches.

"A square of corrugated iron consists of six sheets 8 feet long, or 48 lineal feet of any other length."

By a little calculation we find this company gives you a square as follows:

Six sheets 8 feet long 24 inches wide equal 96 square feet.

Six sheets 8 feet long 23 inches wide equal 92 square feet.

So you see in one instance we furnish 4 square feet and in the other 8 square feet more than they do for a square (for proof see our 1889 catalogue, page 19).

And still another roofing company lately established in the East say in their catalogue:

"We furnish per square of corrugated iron:
5 sheets 10 feet long.
5 5-9 sheets 9 feet long.
6¼ sheets 8 feet long.
7 1-7 sheets 7 feet long.
8⅓ sheets 6 feet long."

Now, by referring to our 1889 catalogue, page 19, you will note that the number of sheets they furnish for a square is identically the same as we specify for 2 and 3 inch corrugation, covering width 24 inches, but on examining the matter a little closer we find another table of gauges and covering widths in their catalogue, as follows:

No. 18 gauge, covering width, 22 inches.
No. 20 gauge, covering width, 22 inches.
No. 22 gauge, covering width, 22 inches.
No. 24 gauge, covering width, 23 inches.
Standard or No. 26 gauge, covering width, 23 inches.

Here we get the "milk in the cocoanut," as we will demonstrate below:

Five sheets 10 feet long, covering width 22 inches, equal 91⅔ square feet.

Five sheets 10 feet long, covering width, 23 inches, equal 95 5-6 square feet.

The actual figures show that in Nos. 18, 20 and 22 we give you 8⅓ square feet and in Nos. 24 and standard or No. 26 we give you 4 1-6 square feet more than this company do for a square. The funniest thing, however, in their table of weights and measurements is the weights they specify per square foot flat, as follows:

	Per sq. ft. flat.
No. 18 gauge	1.70
No. 20 gauge	1.40
No. 22 gauge	1.20
No. 24 gauge	0.88
Standard or No. 26 gauge	0.64

The weights they specify above for Nos. 18 and 22 are a cross between something and nothing, principally the latter. The Nos. 20 and 24 is Birmingham gauge, while the standard or No. 26 gauge is American gauge (see page 4 of our 1889 catalogue). Of all the absurd conglomerations that ever emanated from the very erratic mind of the vice-president of the above company this table of weights "takes the cake."

We have only given you a few comparisons. The same thing to a greater or less extent extends all along the line. We know the American people like to be humbugged, but is it not about time for the buyer and consumer of corrugated iron to stop and consider the facts we have given them in this circular.

Yours truly,
THOMPSON MFG. COMPANY.
CLEVELAND, OHIO, January 6, 1890.

Canada's Foreign Trade.—The aggregate foreign trade of the Dominion in the last fiscal year has been exceeded only five times since confederation, reaching as it did a value of $204,414,098, and if the low prices ruling for nearly all staple goods are considered, it is probable that in volume the commerce of last year has never been surpassed. The value of imports was $115,224,930, and of goods entered for consumption $109,673,447, while the export trade reaches $89,189,167, showing an excess of imports of some $26,000,000, and of goods entered for consumption of $20,500,000. Only once in the history of the country have the exports exceeded the imports—namely, in 1880, when the balance in favor of Canada was $1,420,000; on the average of 22 years the adverse balance has been $20,500,000, and in the aggregate the excess of imports amounts to no less than $451,016,000. So large a drain could not well have been sustained but for the fact that Canada has been a continuous borrower of capital.

To the Pottstown Iron Company, of Pottstown, Pa., has been assigned a patent dated January 14, 1890, for a basic lining for Bessemer converters, invented by Ernst Bertrand, of Kladuo, Bohemia. His plan is to grind dolomite or limestone thoroughly, mix it with water and with or without an adhesive substance, like molasses, and form into bricks. The latter are burnt at a white heat for about 48 hours in a kiln. These burned bricks are again ground and mixed with 10 to 12 per cent. of tar, the product being used to ram up in the converter. Bertrand claims that the preparatory grinding of the stone into brick, the baking of the latter and grinding the burned brick yields a product more homogeneous than can ever be obtained from the cupola or kiln burned dolomite. He claims, too, greater accuracy of material, because there is always a loss of the fine stuff which must be thrown away because it cannot be freed from cinder.

Chester Comstock, of Brooklyn, has assigned to the Iron Clad Mfg. Company his patent recently granted for making "peppered" enameled ironware. When the metallic surface to be enameled has been properly pickled and cleansed he incorporates in the paste prepared in the usual way comminuted or granular oxide of iron. After coating the iron with this paste the article is subjected in the muffle to the usual fusing process. Thus an appearance is produced which the inventor calls peppered enameled ironware.

Profits in the English Iron, Steel and Coal Trades.

Speaking at the annual meeting of the Cleveland Institute of Engineers, held at Middlesborough last month, Mr. Charles Wood, the president, thus referred to the effect of the rise in the prices of coal, iron and steel: "He would now inquire what that great improvement in prices had already done for them, and also what the result would be should prices remain as they now were even without any extra output. He meant the iron, steel and coal trades and all the miners and iron and steel workers, and he took the whole as a community, because no one class in particular was getting the benefit. The prosperity was spread as much over labor as it was over capital, and he had not included any of the engineering, shipbuilding or consuming trades, nor had he taken any account of the increased value of stocks. The calculated prices were based upon what existed about 18 months ago and the amounts given were differences only between the prices then existing and those actually realized by producers this year—in fact, profit to the community during this period. Although there were firms who made money during the bad times and railway companies and royalty owners had not much to complain of, there were others who lost a good deal; therefore, if they said that, on the average no profit was made, everything that had been sold above prices might fairly be claimed as profit to the community and a national gain. There had been many cases where a large volume of trade had been carried on, where every one but capitalists had flourished." He then gave in the following tabular form a statement of the actual results as regards the present year and a forecast of what the situation would be like at the end of the coming year:

	Tons.	1890.	1889.
Total make pig-iron United Kingdom.	11,759,863	£17,639,794	£5,879,931
Puddl'd bars and iron..	2,031,473	3,097,204	2,031,473
Steel rails, &c.....	4,693,213	14,097,658	7,039,829
Coals and coke.....	170,000,000	45,360,000	42,500,000
Totals...	.....	£80,176,656	£57,451,233

The first column gives Mr. Wood's estimate of the profit that will be made during 1890 if prices and make remain the same as in December, 1889. The second column is an estimate of the profit made in 1889 above what was made in 1888.

The detailed report of the engineers on the trial of the cruiser Baltimore has been carefully revised and checked at the Navy Department, and has been made public. It presents some interesting figures. The steam pressure at the boilers is not given, because the gauges were not accurate. The pressures at the engines were: Starboard, 125 pounds; port, 123.4; at first receiver, starboard, 62.2; port, 59.3; at second receiver, starboard, 20.4; port, 21.75. Vacuum in inches of mercury, starboard, 24.5; port, 24.3. Average revolutions per minute, starboard, 116.42; port, 116.17. The indicated horse-power was as follows: High-pressure cylinders, starboard, 1,682.65; port, 1,749.17; intermediate, starboard, 1,514.1; port, 1,555.69; low pressure, starboard, 1,625.62; port, 1,680.61. Circulating pumps, starboard, 23.21; port, 23.21. Total for main engines and circulating pumps, starboard, 4,900.6; port, 5,008.69. Blowers, 110.86. All other auxiliaries, 99.29. Total collective indicated horse-power, for all machinery, 10,064.42. Speed in knots per hour, 20.1; slip of screws, starboard, 18.62 per cent; port, 18.38 per cent. Air pressure in fire-rooms, 2.1 inches. Revolutions of blowers per minute, starboard, 502; port, 630. Coal per horse-power per hour, 315 pounds. Temperature fire-rooms, 93°.

Benner's Latest Prophecy.

Samuel Benner has again come forward as a prophet. His predictions for 1890 will spread dismay among those who fear nothing more than an old-fashioned boom. We print Mr. Benner's latest below, in full:

I predict that prices for iron and railroad stocks will advance and be considerably higher in 1890 than in 1889, and that 1890 will be the most prosperous year for the iron trade, railroads and for general business since 1881.

Iron is the most useful of all metals—it is the monarch of all business, the barometer of commerce; it is the great Jupiter of trade, and when the iron industry is prosperous, so is the general business of this country.

I am well aware that my prediction made last January of the upward tendency of iron and better business for the year 1889, was considered by many persons as premature and would be a failure. The continued low prices had made them discouraged. Yet we have seen the prediction verified—iron has steadily advanced since the middle of February.

The cause and major question which made the turning point from commercial depression to activity in trade was the outcome of the election of 1888, which turned the tide in the minds of a majority of business men at that time, although the turn in business affairs was not apparent until some time later. However, it was scarcely a month after the inauguration of General Harrison when the decline in iron ceased, a decline that had brought about a widespread stagnation in the iron world.

A restoration of confidence in the future has resulted in enlarged trade and in an increase of the industries of our country, making a lively continued demand for iron. A revival in general business stimulates the iron trade, and a rising iron market is the best evidence of it and that it will continue.

The aggregate grain and cotton crops of the past year are the largest in the history of this country, which is an important factor for promoting profitable and voluminous trade, and no doubt was the foundation for the extensive business done during the closing months of 1889. Yet the advance in iron had commenced several months before the extent and outcome of the crops were known.

The only adverse contingency that the most chronic pessimist can argue against the bright business outlook is tight money—yet money is plenty everywhere for legitimate purposes; the banks in Ohio are overflowing with funds, some of them refuse to pay interest on long time deposits.

As we look to the general Government for our supply of currency to increase its volume is plain sailing. Congress should direct the Secretary of the Treasury to issue coin certificates in payment for silver bullion as fast as business expands. Should the Congress of this winter fail to repeal the internal revenue laws, then it ought to pass an act to pension all the soldiers at once, which will relieve the Treasury of a part of the surplus and place the money in circulation this year and next, while the revival of prosperity and increasing business will need and demand it in the channels of trade.

I predict that in five years from this time nearly all the soldiers then living will be pensioned by reason of the disability laws which have been and will be passed by Congress.

The business outlook for 1890 is buoyant for a general revival of trade. We may look in any direction and behold—granaries bursting with the products of the land, factories employed to their fullest capacity; the hum of industry is now heard where a year ago all was as silent as the tomb.

Railroads were never more prosperous; they are unifying and consolidating their lines with immense traffic and reaching out in all directions with new roads to accommodate the increasing business. There will be a boom in railroad stocks this year.

The mining industries will feel the favorable influence the coming spring; the increased demand for coal, ore and other minerals with the revival and activity in general trade will employ the full capacity of the labor of this country; the demand for labor will increase, making wages higher.

The growing winter wheat has a favorable start, which is an indication of a large crop of wheat the coming summer.

The crops of foreign countries are short and below an average, which will make a demand for our surplus grain and provisions.

The balance of trade is in our favor.

We observe as a result of the brilliant outlook that there is a universal scramble for property. British syndicates are sending their money to this country by the millions to buy our breweries, distilleries, nail mills, flour mills, cotton and woolen factories, oil, ore and coal lands, furnaces, elevators and all else they can invest in where there is a prospect of reasonable profit.

All Europe is excited about the scarcity of iron, and where the supply is to come from to meet the requirements of railway extension and military operations in the old countries. Prices have been advancing in England more rapidly than in this country.

We are now in an era of commercial activity unequaled in the annals of trade.

A production of ten millions of tons of pig iron will not supply the demand for 1890. No. 1 pig iron will be low at $30 per ton. The price will advance above that figure this year.

The growth of the United States is remarkable.

Sixty-five millions of people.

Four hundred million acres of improved and cultivated land.

Two hundred thousand miles of railway.

A billion and a half of good money in circulation.

A network of electric wires from ocean to ocean and a profusion of all the elements of wealth.

The progress and improvements in commerce, manufactures and agriculture surpass anything known in the world's history.

Joseph R. Jackson, of Pittsburgh, proposes in a patent recently granted to make sheet-iron by passing the bloom or pile first through a heating furnace, then through plating rolls into another heating furnace, and back and forth from one furnace through the rolls into the other furnace, until reduced to the desired gauge, so maintaining the proper heat for rolling without the necessity of removing it at intervals to a re-heating furnace.

There are 36 car building companies in the United States, and in the year 1889 they turned out 70,546 cars, and at the shops of railroad companies there were doubtless enough cars built to swell the number added to the freight equipment of the roads of this country last year to 100,000 cars.

An Improvement In Gas Furnaces.

We have received the following communication in reference to this matter:

To the Editor.—In your issue of January 9 you published an article headed: "An Improvement on Gas Furnaces," with a sketch by Morris Weis, of Steelton, Pa. This sketch recalled an old drawing in my possession, of which the accompanying sketch shows the exact copy of the important part, to which I beg leave to refer. Both designs, the present one and that of Mr. Weis, show at first sight the same features, the slag pockets as well as the construction of the arches which cover the regenerative chambers. Where they differ, it is undoubtedly in favor of the accompanying sketch. The cut below shows that at that time the designer introduced the improvement of placing the flues independent, instead of side by side, and alternately in one line, each set having its own vertical center line, thus commanding for each set of flues the full width of the furnace. This allows of making these passages between the regenerative chambers and hearth a maximum. To lead the gases up to the hearth in the way described, is now well known to furnace men, and is especially used for open hearth and glass furnaces.

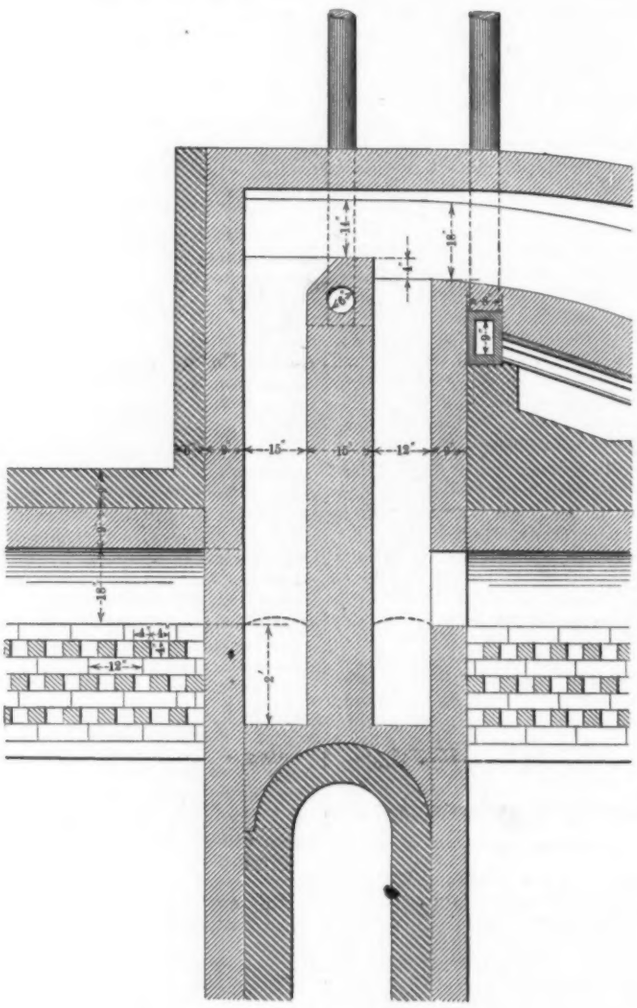
As to the age of this drawing, I may say, that I copied it besides many others, for use by Professor Dürre in his elaborate work "Anlage & Betrieb der Eisenhütten" (Leipzig, 1879–1890). I may further add that the furnace built after this plan was a 3-ton open hearth, was put up at the works of Falkenroth and Kocher, at Hapse, Germany, in 1874. Curiously enough, the drawing is called "Siemens-Martin Furnace, New Design." Comparing it with the design of Mr. Weis, we find again that "There is nothing new under the sun." I have not the least doubt that so far as Mr. Weis is concerned the published design by him is original with him. The case, however, is so drastic, that I thought it worth while to make a few remarks.

Every furnaceman will agree that the slag pockets thus arranged are eminently practical, but as the arrangement of this kind of pocket depends more or less on the direction of the arches of the regenerative chambers they can be used only for a limited furnace width, say up to 6 or 7 feet. For a wider furnace we lose area in the chambers by the necessity of high-turned arches, which require more costly binding (trusses). The inner chamber, which is located entirely below the hearth, has the advantage that the pressure of the arch toward the carrying side walls is to a certain extent balanced by the weight of front and rear wall of the furnace proper; they are identical with the chamber walls below them. In the ordinary Siemens furnace the repairing of the port-holes, which are built in the arches of the regenerative chambers at the most delicate spot of the whole apparatus, involves taking the furnace down, while in the new design these port-holes or passages can be renewed without any trouble and correspondingly small expense, as they form a part independent of the rest of the furnace. There is another feature presented in the accompanying cut which may be worth mentioning. I refer to the large 4 x 4 inch checker brick placed to leave the same distance between them for the gases to pass. These figures may be somewhat extreme, but they show that the designer at that time knew what he was about. To crowd the chambers with checker brick from 1½ to 2 inches apart, thus securing slow travel of the gases, is of the past.

Following up the article above mentioned, we find that the author advocates the building of horizontal instead of vertical chambers. He even proposes to make chambers of like capacity proportionately smaller and longer, in order to heat the gases more thoroughly. I consider this somewhat venturesome, and it will be difficult to demonstrate what can be gained by doing so. The vertical Siemens chamber combines, in my estimation, all advantages for storing and transmitting heat in the full sense of the word with regard to efficiency, and can in no way be excelled by the horizontal chamber. Where horizontal chambers must be used to meet certain requirements, and where location and other circumstances dictate them, they are the right thing in the right place, but that they are superior to the vertical chamber I cannot well admit.

JOSEF REULEAUX.

Cleveland, Ohio, January 20, 1890.



IMPROVEMENT IN GAS FURNACES.

Ericsson's Hot-Air Engine.—John Ericsson, the noted inventor, on March 30, 1880, was granted a patent on a hot-air engine, which later he transferred to Mr. George H. Robinson, of this city, who in turn assigned all his rights under the patent to C. H. Delamater, of the Delamater Iron Works, who secured a release of the patent and proceeded to manufacture the peculiar engine. Mr. Delamater soon found that a number of other firms were engaged in the manufacture of Ericsson's hot-air engine, and he began proceedings to enjoin them. Among the manufacturers engaged in turning out the engines were John Weber, A. Flake, E. Bertine, M. Gibline, S. F. Knapp, C. R. Frisbie, H. Rheinhardt, Joseph Granger and W. H. Harrison. An injunction was asked against all of them, and they made answer that Ericsson was not the original inventor of the hot-air engine and that it was in use prior to the issue of letters patent to him. Judge Lacombe granted the motion as to the priority of Ericsson's patents, but denied it as to the prior use of the engines.

Receiver Parrott Confirmed.—Judge Lacombe, in the United States Circuit Court, has handed down a decision confirming and ratifying the appointment of Mr. Edwin M. Parrott as receiver of the Cameron Iron and Coal Company, of Pennsylvania, in a suit brought against them by the Central Trust Company, of this city. On December 13 last Mr. Parrott was appointed receiver under a mortgage of $1,000,000 made by the Cameron Iron and Coal Company on their Pennsylvania properties to the Central Trust Company, to secure the issue of $1,000,000 worth of bonds, which the trust company guaranteed. The company demurred to the appointment of a receiver, and on arguments Judge Lacombe overruled the demurrer and ratified the appointment of Receiver Parrott. The receiver is given power to proceed in the matter of the mortgage, which was made March 1, 1888, and to act on acceptances held by the Western National Bank, of this city, as collateral, and he is further authorized to prosecute all suits necessary to obtain possession of the defendants' property, which the Cameron people are directed to turn over to the receiver.

A Great Lighthouse.

Bids will be opened in the office of the Lighthouse Board July 1 for the erection of a lighthouse on the Outer Diamond Shoal, off Cape Hatteras, N. C. The total cost of the structure is limited by act of Congress to $500,000. A light has never been erected on this shoal before on account of the extraordinary engineering difficulties in the way, and the work now contemplated will be the greatest undertaking in the line of lighthouse building in the world. There are but two lighthouses built that can be at all compared with it. Those are the Rothersand light at the mouth of the Weser River, Holland, in the North Sea, and 14-foot light at the mouth of the Delaware Bay. The tower is to be 150 feet high from low-water mark to the light in the lantern. The Lighthouse Board does not specify what method shall be adopted, but it is generally understood that an immense caisson, 80 or 100 feet in diameter, with a hollow iron cylinder projecting from its center, will be built at the most convenient port. This will resemble a gigantic iron pan turned upside down, with a tube running from its center. This caisson will have to be towed out to the site, being lifted on the way over a bar where there is but 8 feet of water at high tide. When it is finally at the site it will be sunk rapidly until its cutting edges rest on the sands of the shoal. Then the work of excavation will be begun and carried on as fast as the most modern appliances will admit. As the sand beneath the caisson is excavated and carried up through the tube the sharp edges will sink lower until finally bed-rock is reached. When all the edges rest firmly on the rock the entire caisson and tube will be filled with concerete to a hight of 30 feet above the sea level, converting it into a solid block and column of stone almost as firm as a granite monolith. The action of the seas and the constant scouring of the sand might soon wear away the iron shell, but the concrete will be practically indestructible. It will be protected, however, by a rip-rap packing of granite blocks weighing not less than two tons each. Above this solid structure will rise an iron and steel tower divided into ten stories, including the watch-room and the lantern.

The Hight of Sea Waves—The late Captain Scoresby measured the waves of the Atlantic from the bridge of a Cunarder, and he reported their maximum elevation as being 26 feet. Worse weather than he ever met with must have prevailed in the Atlantic of late years. Full-powered passenger steamers have had their bulwarks shattered, their deck ladders torn away, their boats wrenched from their davits, and the iron davits themselves twisted like pin-wire. Now the boats of such vessels are swung high aloft above the deck. Therefore the seas which smashed them into matchwood and twisted the davits from which they were torn must have been of greater elevation than 26 feet. Not very long ago the Servia was the largest and most powerful passenger steamer afloat. Seen on smooth water in her ordinary trim her towering hight seems to make her secure against being boarded by any wave, yet on one occasion a leaping sea struck her with such violence that it flattened one of her huge funnels. The hight of that wave must have been nearer 50 feet than 26. The other week the Dundee screw-liner Croma arrived at New York in a sea-battered condition and reported fearful weather. She had actually shipped a sea down her funnel—an elevation of 56 feet above the ordinary water level. If steamers having a fair degree of buoyancy meet with such experience what wonder is it that heavy-cargo steamers like the National Line steamship Erin, their decks loaded with cattle, occasionally go to the bottom.

Exports from New York.

The following statement compiled from the records of the custom house shows the quantity and value of metals, machinery, engines, implements, &c., exported from New York during the calendar year ended December 31, 1889:

	Quantity.	Value.
Horse-powers	.....	$3,242
Mowers and reapers	.....	2,267,525
Plows and cultivators	.....	793,413
All other agricultural implements and parts	.....	677,510
Carriages, horse cars and parts of	.....	1,594,033
Steam passenger and freight carr, No	1,276	719,683
Clocks and parts of	.....	1,306,120
Copper ore (2240 pounds), tons	17,622	1,935,962
Copper, ingots, bars and old, pounds	16,324,811	1,846,993
Copper, sheets, pounds	20,112	4,546
Copper, all other manufactures of	.....	45,017
Pig iron (2240 pounds), tons	416	7,438
Band, hoop and scroll iron, pounds	22,209	676
Bar iron, pounds	302,695	7,531
Car-wheels, No	8,877	75,228
Castings, not elsewhere specified	.....	101,804
Cutlery	.....	100,159
Firearms	.....	850,484
Ingots, bars and rods of steel, pounds	25,126	1,799
Locks and other builders' hardware	.....	1,339,876
Machinery, not elsewhere specified	.....	5,902,926
Nails and spikes, cut, pounds	8,092,317	184,382
Nails, wire, horse-shoe, tacks, &c., pounds	1,669,676	149,667
Iron plates and sheets, pounds	320,364	11,920
Steel plates and sheets, pounds	75,743	2,526
Printing presses and parts of	.....	200,906
Steel railroad bars or rails, tons	980	34,388
Saws and tools	.....	1,792,490
Scales and balances	.....	288,190
Sewing machines and parts	.....	2,305,891
Steam fire engines, No	2	4,039
Locomotive engines, No.	78	626,952
Stationary steam engines, No	250	178,208
Steam boilers and parts of engines	.....	346,900
Stoves, ranges and parts	.....	194,020
Wire, pounds	16,762,225	559,220
Iron and steel, all other manufactures of	.....	1,529,250
Quicksilver, pounds	4,813	2,980
Zinc ore or oxide (2240 pounds), tons	1,337	73,796
Zinc, pigs, bars, plates and sheets, pounds	789,656	33,456
Zinc, and other manufactures	.....	11,468

In a review of the export trade it is painfully noticeable how small a proportion of the enormous aggregate was shipped under the American flag. Out of a value of $336,784,763 which cleared from this port in 1889, only $22,980,248 went in American steamers and $18,587,613 in American sailing vessels. The remaining $295,216,902 were shipped in foreign vessels, $261,325,196 in steamers and $33,891,706 under sail.

Iron Roadways.—In the Pennsylvania Legislature the improvement of the highways of that State has received much consideration, and an iron track, rather than one of other materials recommended by H. Neidig, a mechanical engineer, is apparently regarded with favor. He says: "An iron track, somewhat analogous to a street-car track, must be provided for the wheels. This may be an iron bar, 6 or 8 inches, flat on the under and slightly concave on the upper surface. That is to say, the bar is passed through rolls, leaving the upper side thin to the center and heavier to the edges. The middle may be ⅜ inch and gradually to the edges ½ inch thick. The bar thus fashioned, is to rest on a plank laid lengthwise underneath and this, to rest on stone, short posts or cross-ties, and the track to be nearly even with the general surface. It is not necessary to do much grading; the team travels between the rails and this space may be cobbled, graveled or cindered, or left unimproved, as the main thing has been secured—a roadway for the wheels. Such a road is a tremendous factor in its own construction, as a good track is at once secured to transport material on, and as to cost, it is considerably less than either plank, stone or gravel. This would open up a new field for iron, add largely to the value of farms along and near its lines, would be a powerful auxiliary to local transportation, would add immensely to the common wealth, while hauling and driving would be a pleasure to man and beast alike. On no other kind of road can loads be hauled so large or so rapidly, and it can be shown that as a toll road, at only a moderate charge, from 15 to 25 per cent. per annum can be realized on cost, clear of the expense of wear and tear."

Iron Making at Florence, Ala.—In a neat pamphlet published by the Florence Cotton and Iron Company, an organization chiefly under the control of Philadelphia capitalists, we find the following estimate of cost of making iron at Florence, by John M. Hartman, of Taws & Hartman, Philadelphia. Mr. Hartman says: From all the data which I have been able to gather from the furnaces which were accessible to me at Sheffield and Florence the cost of making iron per ton will be as follows:

Jasper coke, 240 pounds, at $2.75 per ton	$2.95
Ore	3.30
Limestone	.50
Labor	1.50
Repairs	.50
Loss in coke and ore	.34
Supplies taxes, insurance, office and sundries	1.13
Interest on investment and profit and loss, &c	.57
Total cost	$10.79

This is as cheap as iron can be produced by any furnace at Birmingham, Ala., with one exception.

The Aluminum Metal Mfg. Company, of 40 Water street, Boston, are manufacturers of what they call an aluminum "flux." They publish a circular in which they give the following results of tests made at the works named:

	—Tensile strength.— Without flux.	With flux.
South Boston Iron Works. Cupola casting	16,215	19,091
South Boston Iron Works. Gun iron casting	30,016	31,760
Franconia Iron Works. Puddled billets (1 per cent. of flux)	52,782	59,276
South Boston Iron Works. Gun iron (0.5 per cent. of flux)	28,592	32,696
South Boston Iron Works. Copper casting (3 per cent. of flux)	19,000	28,305
Franconia Iron Works. Puddled bar iron (1 per cent. of flux)	42,276	53,291

The Boston and Lockport Block Company, at East Boston, have also experimented with the flux.

During the past year the receipts of the Cooper Union for the advancement of science and art amounted to $47,286.83, of which $15,773.75 was interest on endowments and $900 a donation. The expenditures were $46,157.48. The free night classes in science and art cost $10,131.85, and the free art school for women $10,185.01.

THE WEEK.

Zinc carbonates are being shipped in considerable quantities from the Hanover Mines in New Mexico to La Salle, Ill., for treatment, freights between those points having been reduced to $13.25 per ton. The mines are believed to be among the most important in the country, as the zinc belt extends for five or six miles.

An extensive covered pier, 900 feet in length, will be erected at the Atlantic Docks, Brooklyn.

The agreement under which the Lehigh Valley Railroad Company will supply the city of Newark, N. J., with a maximum of 50,000,000 gallons of water per day gives the company the option of becoming the absolute owner in its own right of the said water works upon the payment therefor of the sum of $6,000,000, of which $4,000,000 is to be paid upon the delivery of the works, and the remaining $2,000,000 at the expiration of eleven years from the date of the contract.

The Philadelphia *Ledger* asks: "Why should the Government be expected to furnish a market for an over-production of the 'white metal' any more than for an excess in the production of the black metal, iron, or the red metal, copper?" No one has yet furnished a satisfactory answer to that question.

A snow plow invented by Master Mechanic A. F. Priest, of the Eastern Minnesota Railway, has been doing effective service on the Northern Pacific.

The farmers in some of the Western States are petitioning the railroads to make what they call an emergency rate for the transportation of corn to the Eastern markets. They claim that the surplus corn product is valueless at present prices, inasmuch as the cost of getting it to market absorbs so much of the proceeds that they have not enough left to pay them for the labor of raising it. They base their appeal upon the theory that a reduction of the freight would add just that much to the amount received by them for their corn; but it is a well-known fact that a general lessening of freight on a given product does not always give an advantage to the producer.

The cable in Minneapolis has been abandoned for electricity, which operates with entire success where employed on another line and is likely to be introduced throughout the city.

State Comptroller Wemple, at Albany, suggests the importance of enacting a law providing for the taxation of personal property, as represented by the indebtedness of corporations. He believes the amount legally liable is equal to the valuation of real estate and should share in sustaining the burden. The total bonded indebtedness of the corporations of this State is believed to equal two thousand million dollars. The Comptroller would impose a "reasonable tax for State purposes upon the interest or income paid annually upon the bonded indebtedness of corporations and joint stock associations, to be retained by all such corporations and associations and paid into the State Treasury."

The French authorities adopted the Lebel rifle in the summer of 1887, and immediately began the manufacture of this destructive weapon on a large scale. The whole army has by this time been fitted out with the new weapon. According to all accounts this rifle must be the most deadly weapon yet invented, with the possible exception of the Maennlicher repeating rifle, with which the Austrian infantry is now being fitted out. The Lebel rifle, it is expected, will effect a complete change in the battles of the future. Its ammunition produces no smoke, and the report of its detonation can scarcely be heard, so that its use will not betray the position of the troops armed with it. It will carry its bullet more than a mile and a half, and with a more certain aim than has been possible with ordinary rifles.

When the Reading Railroad shall have built its bridge across the Susquehanna River at Harrisburg, and have constructed a connecting line to the Baltimore and Ohio Road at Hyndman, the new route thus opened will be almost an air-line between New York and Cincinnati, St. Louis and the Southwest. It is reported that the Reading intends to run vestibule trains between Harrisburg and New York, and to make the new line a strong competitor to the Pennsylvania.

For the current year the New York State tax is $12,557,352.74, the rate being three and fifty-two one-hundredths mills, and the valuation of property $3,567,429,757. The tax to be devoted as follows:

School purposes	$3,460,406.86
Canals, including canal debt.....	2,639,898.02
General purposes..	6,457,047.86
Total.....	$12,557,352.74

The Comptroller reports a surplus of $1,500,000 in the Treasury.

The Treasury Department decides that iron show cards must pay 45 per cent. ad valorem.

The Supreme Court compels a reluctant railroad company to adopt steam heating. For a long time the New York, New Haven and Hartford Railroad Company have held out against the law requiring the substitution of steam heat on all roads over 50 miles in length. The company claimed that it was exempted, as only 26 miles of its line lay in the State of New York. The State brought suit for penalties amounting to $7000, and the company demurred. Upon the demurrer Judge Ingraham, in Supreme Court, Special Term, gave judgment for the State, holding that the law applied to all trunk lines coming into the State. Upon appeal the general term sustained Judge Ingraham.

The sugar importers, Willett & Gray, in their annual review, give the imports of sugar into the United States during 1889 at 1,008,810 tons, this being a decrease from the previous year of 75,370 tons, the imports in 1888 being 1,084,810 tons. The sources from which the supplies were drawn show, as against 1888, some changes, the most striking being increases of 55,056 tons from the Philippine Islands and 21,544 tons from Java, with decreases of 60,005 tons from Cuba, 58,662 tons from Brazil and 19,933 tons from Europe. For several years preceding 1889 there was an average annual increase in the consumption of 5 per cent. and in estimating supply and demand 12 months ago this rate of increase was mostly adopted. The actual results show a temporary arrest of the expansion, due probably to the high prices of 1889. The total consumption of the United States in 1888 was 1,457,264 tons, or 52.65 pounds per capita: in 1889 it was 1,457,561 tons, or only 51.015 pounds per capita.

The Cumberland Gap Tunnel, which opens up the connection between the Louisville and Nashville, and the Norfolk and Western, will be completed in February. It is 3587½ feet long. A vein of fine coal 5 feet thick was passed through.

A plan for freight interchange on a grand scale at Chicago is urged by President Stocking, of the Chicago, St. Paul and Kansas road. He proposes to have the yards of all the large railroad systems which enter Chicago built around a circular track outside the city. From this circular track other tracks are to radiate to each yard in its vicinity. When a car is to be transferred from the Baltimore and Ohio yard to the Pennsylvania for instance, it is sent from the Baltimore and Ohio yard down the radiating track to the circle and moved around it until it gets opposite the track leading to the Pennsylvania yard. Then it is sent down to its destination with very little time lost during the entire process.

The latest development in the attempted boycott of England by the traders of Portugal is the establishment of a line of steamships, under the Spanish flag, to run between Lisbon and Brazil. The Portuguese newspapers prophesy that the result will be the downfall of English steamboat companies and of England's commercial greatness. But there may be a mistake somewhere.

It has been predicted that the result of the conclusion of negotiations between the Peruvian Government and its bond-holding creditors would be apparent in the execution of contracts held by Americans for building railways in Peru, and which would amount to not far from $30,000,000 a year. Already the first indication of this lively and profitable commerce has come. One day last week, in response to a cable from London, it is said that estimates were promptly sent out as to the cost of an iron bridge to be used in the extension of the Oroya Railroad, and expectations are that before the spring opens American contractors will find themselves loaded with important engagements. The money is advanced by the English syndicate which is now undertaking to carry out the colossal improvements commenced in former years.

Important changes in the New York harbor line are proposed, affecting wharf property at Hoboken, Jersey City and Communipaw, also at South Brooklyn, Bushwick Creek and Gowanus Bay. The Harbor Line Board, of which Gen. Henry L. Abbott is president, heard statements by Thomas F. Rowland, of the Continental Iron Works; Capt. John W. Ambrose, president of the South Brooklyn Ferry Company; George M. Alcott, president of the Phenix Chemical Works; R. T. Bush, representing the Bush & Denslow Mfg. Company; M. D. Lawrence, representing William H. Beard and the interests of the Erie Basin and many others. Mr. Rowland showed that the proposed changes in the water front would practically preclude the Continental Iron Works from launching boats and render the securing of supplies in the shape of coal and iron by that company a matter of extreme difficulty. A further hearing will be had in February.

A machine in Providence, Rhode Island, is successfully converting ramie fiber into valuable textile products.

The extension and enlargement of facilities for travel on the Manhattan Elevated Railway in this city is supposed to be included in the company's scheme for raising $40,000,000 from the issue of a new 4 per cent mortgage.

Throughout Pennsylvania there is a general movement, headed by the State Road Commissioners, to improve the public highways. A durable and smooth bed of broken stones, rolled and concreted, is considered the correct standard.

Discussing the question, "What shall succeed the Interstate Railway Association," the *Stockholder* presents in detail the plan advanced by Drexel, Morgan & Co., and concludes: "If all attempts at a combination between the competing roads on a basis of real strength are abandoned, the same state of affairs will return as existed in the summer of 1888. If, on the other hand, a compact business-like confederation is entered into—one having the cohesive force of the trust without necessitating corporate union—the disastrous ef-

fects of ruinous competition will be avoided and the roads will do business on a paying basis until the country grows up to a point giving business to the extent of their capacity."

The Canadian Marine Association, at Toronto, unanimously passed resolutions asking the Government to remove all duties on materials used in the construction and equipment of Canadian built vessels. It was represented that on a vessel costing $250,000 the material might be set down as one-third of the value, and the statement was made that with a free import of raw material $40,000 to $50,000 might be saved on steel vessels 255 feet long, as compared with prices paid at Detroit or Bay City.

There are excellent prospects for an electric railroad being established between Providence, R.I., and Pawtucket; in fact, it is assured, providing the General Assembly acts favorably on the bill which will early come before it for consideration asking for the incorporation of a company to be known as the Pawtucket Cable Tramway Company, and giving said company power to build an electric railroad between the two cities.

The taxable property in Johnstown was reduced $700,000 in the flooded district. Including the loss of personal estate and of corporations the totals are $7,000,000 or $8,000,000.

Subsidizing African steamship lines is popular in Germany.

It is proposed to bridge the Delaware River at Philadelphia. From $2,000,000 to $4,000,000 will be wanted.

The four large connecting rods made by the Cleveland (Ohio) Forge Works, for the Fall River steamer, Plymouth, weigh over 4 tons each

Otis Brothers, elevator builders of this city, have brought suit before the Tribunal de Commerce de la Seine, in Paris, against Gustav Eiffel, designer of the celebrated Tower, to recover a balance of $14,700, alleged to be still owing on the $30,000 contract.

Cashier Geo. H. Lounsbery, of the New York postoffice was declared to be a defaulter to the extent of $45,000, and to avoid arrest shot himself at his home in Hackensack, N. J.

By an explosion of natural gas in Columbus, Ohio, on Friday evening six lives were lost and 29 persons seriously injured. Two houses were blown into wreckage. The explosion as near as can be ascertained, resulted from a defective joint in a gas pipe.

The Boston fire commissioners have been requested by the City Councils to report the cost of supplying the business districts with water piped directly from the harbor. Possibly the disused plant of the steam heating company may be utilized in the manner suggested.

J. O. Draper, of Pawtucket, R. I., has published a plan improving Pawtucket River. He proposes the building of a dam at the mouth of the river, with locks of suitable hight and width, thus making a canal large enough to accommodate vessels that would be likely to come up the river; he then proposes that the channel be straightened and walled in with slips at convenient points where vessels could anchor, the hills on either side furnishing sufficient material for filling in.

Cleveland is much interested in the construction of works in progress in that city for some unknown purpose. The only persons known in the enterprise are David R. Paige, of New York, and a representative of the Standard Oil Company. The name of the corporation is the Cleveland Crystal Company, and from the fact that a deep well is being bored into a salt water vein the design is supposed to be to manufacture soda by the ammonia process.

In the case of the 14 men drowned in the bridge caisson on January 9th, a coroner's jury in Louisville, Ky., has found that the accident was the result of the men in the caisson becoming panic-stricken.

There is no improvement in the coal market at Pittsburgh, Cincinnati or Louisville.

The name of "Count Mitkiewicz" again comes into notice coupled with another grand Chinese banking and railway scheme similar to that with which the name of Wharton Barker, of Philadelphia, was associated not long ago, but which came to naught. It is now stated with some appearance of truth that the present Chinese Minister to Washington came out to this country under instructions from the Chinese Imperial Government to reopen negotiations without delay. The secretary of the Chinese legation at Washington is represented as saying that the plan for the establishment of a bank in China with American capital, which has been discussed for so long, is about to be put into operation under the direction of Li Hung Chang, the Prime Minister of China, and that the trusted agent of the Prime Minister is Count Mitkiewicz. The concession includes the right to construct railroads, establish a bank, erect a mint and other projects of like character. The Government of China is to have a one-half interest and control and the American capitalists the other half. The latter are spoken of as responsible men in New York and Chicago, but details of the scheme are lacking.

The post office receipts at 30 large offices during the closing quarter of the year show large gains, the total being $6,278,618, against a total for the same quarter in 1888 of $5,692,062, a difference of 10.31 per cent. The full figures for the seven largest offices were as follows:

Office.	1889.	1888.	Per cent.
New York	$1,590,649	$1,458,585	9.4
Chicago	815,987	714,990	14.1
Philadelphia	596,045	551,003	8.1
Boston	563,932	502,378	10.2
St. Louis	289,333	261,573	10.6
Cincinnati	213,179	196,142	8.7
Brooklyn	198,310	180,292	10.0

These figures indicate that the business of the country is being conducted on an increasing scale.

The work of locating a new coal mine has been commenced at Portsmouth, on what is known as the Hazard farm, located on the east side of Rhode Island. More than half a century ago some coal was taken out, but at that time the digging proved unprofitable. A quantity of regular prospecting machinery is on the spot and more is *en route*.

There were 576 wells drilled in Washington County, Pa., last year, at a cost of about $4,000,000, and the oil produced numbered 4,015,000 barrels.

The steel steamship Maverick, built by the Columbian Iron Works, Baltimore, and launched last week, is the largest steamship ever built in that city. She was built for the Standard Oil Company and will run between Boston and Philadelphia, carrying 500,000 gallons of oil at a single trip.

Fighting the snow with great rotary snow plows is the principal business of late on the Central Pacific and other railroads in the Far West. The experience obtained in working these machines will be useful.

No more successful public improvement has been made in the South during the last few years than the levees, which have protected and brought into use again millions of acres of fertile alluvial lands in Louisiana and Mississippi. They have added much wealth already to those States; but what has been so far gained is as nothing compared with what may be expected when all the lands thus rescued are under cultivation, as they soon will be.

The inhabitants of the annexed district in Harlem advocate the construction of a tunnel as a substitute for a drawbridge at Harlem River. The tunnel would cost $2,000,000.

In the case of James H. Pool against the Vacuum Oil Company, at Rochester, N. Y., the jury awarded a verdict of $45,627 to the plaintiff. Pool's mill was completely destroyed by an explosion of naphtha that, through carelessness on the part of the company, it was claimed, leaked into the city sewers about two years ago. This is one of several suits for large amounts growing out of the explosion.

A committee of citizens in Cleveland, Ohio, of which Professor Olney is chairman, propose to organize a society to abate the "smoke nuisance."

The industries of Maine have taken a new start, nearly $4,000,000 having been invested in new enterprises during the last year.

In the Supreme Court in Iowa, at Des Moines, Judge Given, on an appeal, decides that a number of shippers in Jasper County are entitled to recover rebates from the Chicago, Rock Island and Pacific Railroad equal to the amount allowed other shippers in the years from 1880 to 1884. Under the common law the carrier was not allowed to charge more than a reasonable rate.

The skippers of three steamships, the California, from Hamburg; the Friesland, from Antwerp, and the Rhaetia, from Hamburg, are enthusiastic in their praises of oil as a wave-breaker. The Rhaetia used the fluid with magical effect in a hurricane on January 17. The Friesland, on the same day, kept the towering sea from breaking aboard the ship by a liberal use of oil. The California, while hove to under small sails in the same terrific wind, saved herself by using oil.

A decree of the Chilian Government fixes March 1 as the date for receiving proposals for the construction of a narrow-gauge railway from the nitrate of soda fields of Agua Santa to Junin.

A new forge or blacksmith shop is in course of construction at the Brooklyn Navy Yard, to aid in building the new cruisers and a new machine shop will be necessary.

The new Havana steamer Yumuri, built at Chester for Ward's line, made about fourteen knots an hour on her trip to New York. Her officers say she will prove herself a fine sea boat.

A Verdict Against an Inventor.—A verdict for $200,000 and interest was rendered in this city on Friday by a jury in Supreme Court, Part I, before Judge Lawrence, in the suit of William Pitt against Charles Kellogg for violation of agreement. Pitt is a broker and Kellogg an inventor, who held five patents upon seamless steel tubes. Pitt was to have $200,000 for organizing a syndicate to utilize the patents. He and Kellogg met representatives of Pitt's syndicate, Messrs. Garrett, Sloan and Hill, in Philadelphia, and four of the five patents were exhibited in models. An adjournment was taken to allow Kellogg to produce the fifth model, which was the principal one. Instead of keeping his engagement, Kellogg was accused of taking the model to Boston and placing the invention with a syndicate there, capitalized at $2,000,000. Pitt then sued for his commission.

MANUFACTURING.

Iron and Steel.

The production of steel rails at the Edgar Thomson Steel Works, of Carnegie Brothers & Co., Limited, at Braddock, Pa., for the present month is largely in excess of the make for any similar period in their history The daily average output has exceeded 1100 tons, and during one day last week the production was 1250 tons. On the night of the 23d inst. the output of No. 1 turn for 12 hours was 25,029 rails. The largest number ever turned out before was 16,069 rails in eight hours. A new extension, 47 x 138 feet, is being added to the plant. In it will be placed two additional straightening machines and two drill presses. The two blast furnaces now in course of erection by this firm are rapidly approaching completion. Furnace H is almost ready for blast and will probably go in the latter part of next month. Furnace I is not so far advanced and will hardly be ready for blast before May next.

The Glen Iron Works, at Allentown, Pa., were sold on the 16th inst. by order of court, under a foreclosure of mortgage, to the Allentown Rolling Mill Company, for $45,000. The plant has been operated under lease by the last named company for some years.

A company is in process of formation for the purpose of erecting and operating an iron and steel plant at Dunbar, Pa. The capital stock is placed at $75,000. Dr. J. J. Miller, of Dunbar, was instrumental in forming the company, which is composed of business men of Dunbar, New Haven and Leechburg. Bliss & Marshall have donated a site of 12 acres for the plant. The plant will contain for the present eight puddling, one scrap and three heating furnaces and two sheet mills.

The Tyler Tube Mfg. Company, of Boston, have definitely decided to remove their plant to Washington, Pa. The reason given for the removal is that the New England manufacturers cannot compete with the Pennsylvania mills, the fuel and other material costing too much for transportation and leaving little or no profit. The boiler tubes made by this company are the standard of the United States Government for naval boilers, and they ship tubes to France, Germany, Austria and Scotland.

At Pittsburgh last week the Bank of Pittsburgh entered suit against David M. Long, to recover on a note for $5000 made by Long & Co. on August 20 last and due on December 23. Suit was also entered by the same bank against Long & Co. to recover on a promissory note running the same dates and payable to the order of D. M. Long. The Mechanics' National Bank also entered a suit against D. M. Long to recover on a note for $3000 made by Long & Co. and payable to the order of D. M. Long, and the Union National Bank entered suit against D. M. Long to recover on a note for $10,000 made by Long & Co. and payable to the order of D. M. Long.

Jones & Laughlins, Limited, proprietors of the American Iron and Steel Works, at Pittsburgh, are building an additional blooming mill.

Messrs. H. O. Bonnell, W. Scott Bonnell, Capt. J. L. Botsford, Richard Broom, C. D. Arms, Frank P. Wick and T. F. Woodman, well-known iron manufacturers, of Youngstown, Ohio, and George S. Griscom, of Pittsburgh, have organized the Lakeside Nail Company and leased a large nail factory owned by the Chicago Steel Mfg. Company, at Hammond, Ind., and will place it in operation at once producing cut nails. The plant is new and one of the best equipped in the country. It has 101 automatic nail machines, and will produce 25,000 kegs of nails per month. Messrs. Griscom and Woodman will have charge of the company.

Joseph Hopkins, of Youngstown, Ohio, has commenced suit against A. M. Byers, of Pittsburgh, doing business as the Girard Iron Company, for $30,000 damages. Hopkins was employed at the Girard furnace and alleges that by reason of a defective platform on which he was placed to work he received injuries that he claims have crippled him for life.

The Jefferson Iron Works, of Steubenville, Ohio, are dismantling their Bessemer steel plant, which has been idle for some two or three years.

Jennings Bros. & Co., Limited, proprietors of the West Penn Steel Works, at Leechburg, Pa., who recently removed the open-hearth department of their plant to Preble Avenue, Allegheny City, Pa., have now moved their offices to that location. Their post office address will be Pittsburgh, Pa.

The Syracuse Iron Works property, which has been in litigation since 1884, has been sold to Charles B. Everson, of Syracuse, for $25,300. Charles M. Warner, of Jordan, and A. A. Howlett, of Syracuse, bought the horseshoe factory. The rolling mill will be started as a merchant-iron mill.

After the repeated rumors about the Addyston Pipe and Steel Company, the annual meeting of stockholders was rather anxiously looked for. The officers elected were: M. Addy, president; W. P. Anderson, vice-president; J. H. Domhoff, secretary; B. F. Houghton, treasurer, and M. Addy, W. P. Anderson, Larz Anderson, J. N. Kinney and Briggs Cunningham, directors. W. P. Anderson takes the place of George Wilshire, whose stock had been purchased when Dwight Kinney's dual position was divided between Domhoff and Houghton. It was decided to increase the capital stock from $1,200,000 to $1,500,000, and the additional stock was all taken up by the stockholders at par. The usual annual dividend of 6 per cent. was declared by the directors.

The Thomas Iron Company have declared a regular semi-annual dividend of 5 per cent. and an extra of 2½ per cent. This is a veritable harvest period for iron manufacturers.

J. W. E. Allemong, president of the Salem Improvement Company, of Salem, Va., at the annual meeting of the company presented a report of the financial condition of the concern. It shows assets of $538,363, including $59,711 cash, $265,052 interest-bearing notes and $213,600 as value of reserved lots. The liabilities are $46,730 on notes due two parties. Only $60,000 has been called and paid in since the company were organized on the 2d of October, 1889.

Gordon, Strobel & Laureau, Limited, of Philadelphia, have closed a contract for an additional 20 x 60 Gordon-Whitwell-Cowper fire-brick stove for the Jefferson Iron Works, Steubenville, Ohio.

The Simonds Rolling Machine Company, of Fitchburg, Mass., are making quite extensive additions to their plant, under the superintendence of John J. Mant.

McClure & Amsler, engineers and contractors, of Pittsburgh, have received an order from the Bellaire Nail Works, Bellaire, Ohio, for a fourth Massick & Crooke hot-blast stove, 18 x 65 feet. The blast furnace of this firm has just been fitted up with three stoves of this design, and the fourth stove just ordered is in the nature of a reserve stove. The Illinois Steel Company have been licensed by McClure & Amsler to erect 16 of these stoves at South Chicago, where the company are erecting four blast furnaces. The stoves will each be 22 x 70 feet.

Application has been made for a charter of incorporation for the Lukens Iron and Steel Company, of Coatesville, Pa.

The Clinch Valley Coal and Iron Company have decided to erect a muck bar and rolling mill and wrought-iron pipe works at Richland, Va., on the Clinch Valley extension of the Norfolk and Western Railroad, 38 miles west of the new town of Graham, which is located at the junction of the Clinch Valley extension and the Flat Top Division, running into the Pocahontas Flat Top coal field. A branch line from Richlands to the coal fields of the Clinch Valley Coal and Iron Company is now being constructed, and it is expected that shipments will be made from these mines by the 1st of April.

The number of tons of iron and steel which was imported into Providence, R. I., during the month of December, 1889, was as follows: From Baltimore, 1097 tons; Philadelphia, 842 tons, amounting to 2749 tons. Pig iron—New York, 800 tons; Perth Amboy, 2075 tons; total, 2875 tons.

No. 1 Pioneer Furnace, of the Pottsville Iron and Steel Company, Pottsville, Pa., has gone into blast.

Cordelia Furnace, Columbia, Pa., is preparing to go into blast.

Machinery.

An adjourned stockholders' meeting of the Standard Underground Cable Company was held in the office of the company, in the Westinghouse Building, Pittsburgh, on Thursday, the 23d inst. The report of the company showed a business of $615,000 for the year 1889, with a net profit of nearly $110,000, or 11 per cent. It brings the present surplus of the company to upward of $140,000. The company commenced the new year with orders in hand amounting to $135,000. The cables and wires of this company were sold during the year 1889 to 255 customers. These customers are situated in almost every State and Territory of the United States, and in Canada, New Mexico, Cuba, South America, Africa, India and Europe. The cables of this company are used for every form of electrical service. Mr. George Westinghouse, Jr., was elected president of the company for the ensuing year, and the following gentlemen were elected as directors: George Westinghouse, Jr., Robert J. Pitcairn, Caleb H. Jackson, Mark W. Watson, John H. Dalzell, J. W. Marsh and Henry Snyder.

Thomas Carlin's Sons, of Allegheny City, Pa., have recently shipped one of their 6-foot ore-grinding pans to the Linden Steel Company, Limited, of Pittsburgh, and are just completing two pans for the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa. One of their dry pans was recently put in the plant of the Allegheny Bessemer Steel Company, at Duquesne, Pa., while several others have been placed in different plants in Pittsburgh.

Application will be made in a few days for a charter for the Union Foundry and Machine Company, of Pittsburgh. The applicants will be Messrs. F. N. Hoffstot, James M. Bailey, James W. Friend, Frank H. Zimmer and C. C. Morrow. The works will be located on the old Clinton mill property on the South Side, Pittsburgh. The foundations for the new foundry and machine shop have been laid, and it is expected that the new plant will be in operation by April 1. The new foundry will be 120 x 90 feet. The machine shop will be 60 x 100. The plant will give employ

ment to about 150 men. The works will be operated exclusively on heavy machine mold gearing. This concern will succeed to the business of the Union Foundry and Machine Company, Limited, whose plant located in Allegheny City will be abandoned.

The Westinghouse Electric Mfg. Company, of Pittsburgh, have secured 15 acres of ground at Brinton Station, on the line of the Pennsylvania Railroad, and will soon commence the erection of new works with the intention of occupying them next year. Mr. John R. McGinley, secretary of the company, has made the following statement in regard to the new plant: "The plans for the new buildings have not been finished, but the great object will be to have them so constructed as to give as much ground floor room as possible. With work of this kind a four or five story building, such as it now occupies, is not desirable. How much money will be put into the new plant has not been determined, but it will not cost less than $300,000. The site is the most desirable and convenient. The Turtle Creek Valley Railroad will be built the coming summer from Wilmerding to Bessemer, where it connects with the Pittsburgh, McKeesport & Youghiogheny Railroad. The line will run close to the works. The present site will be sold as soon as the new works are erected, and I think by this time next year you will see the works nearing completion." The above company have just received an order from the city of Boston to supply 6000 incandescent lights and 650 arc lamps.

The illustrated catalogue of Robert Deeley & Co., of New York, describes their sugar machinery for plantations and refineries. This may be said to include all appliances necessary in that industry from the smallest fitting up to machines of mammoth proportions. There is no machine of essential importance in the process of refining sugar which is not here fully mentioned.

The E. Horton & Son Company, of Windsor Locks, Conn., have just issued a catalogue fully describing and illustrating their well-known lathe chucks and also their chucks for brass finishers' use, grinding machines, milling machines, screw machines, upright drills, cutting-off lathes, boring mills, &c. The catalogue describes not only those chucks which are well known and widely used, but also gives the latest improvements and the many forms of special chucks which have been placed on the market by the above company.

The Rockford Electric Mfg. Company, of Rockford, Ill., have just issued their catalogue for 1890. In it they describe their dynamos and lamps for arc and incandescent lighting and also the many necessary fixtures. They also present illustrated descriptions of their automatic electric motors

The Pawtucket Mfg. Company, who have previously received orders from England for their machinery, received another order the past week from the Dobcross Iron Works, near Oldham, England. The order calls for one of Webb's patent double revolving or piling furnaces, one upsetting machine, with the latest improvements, one combined bolt pointer and trimmer and one six-spindle solid die bolt threader. This will make the third shipment of machinery to the Dobcross Iron Works. When these machines are set up and started the company propose to order more machinery of the Pawtucket Mfg. Company for their plant.

From the Goulds Mfg. Company, of Seneca Falls, N. Y., we have received an interesting catalogue describing and illustrating the many machines built by them. The list includes suction and force pumps of several designs, automatic pumps operated by water pressure and triplex suction and force pumps for high or low pressure service. The price of each style of pump is given in the catalogue.

The Diamond Machine Company, of Chicago, Ill, intend to leave the strictly machine line of their business to machine manufacturers and confine themselves to the production of grinding, milling and polishing machinery, emery wheels and supplies. In accordance with this change they will dispose of the contents of their Chicago store.

We have received from Thomas Carlin's Sons, of Allegheny, Pa., a stock list for January, 1890. Here we find several vertical and horizontal engines, hoisting engines, steam and centrifugal pumps, derricks, new and second-hand boilers, pulleys and shafting and general machinery.

A good-natured rivalry exists between a couple of stations of the Metropolitan Electric Light Company, of London, which are respectively run by Westinghouse compound engines and single-acting engines of English make. Although we are not furnished with all the data regarding a recent friendly competition between the engines, we can imagine the results from the fact that orders have been received by the Westinghouse Company for four additional compound engines for the same station.

From the Salem Foundry and Machine Shop, of Salem, Mass., we have received a small pamphlet describing and illustrating their automatic lock elevator well grate. It is claimed that the use of this device will prevent falling through elevator openings, for the simple reason that the gate is always locked except when the elevator car is at the landing.

The Detrick & Harvey Machine Company, of Baltimore City, a corporation, succeeds the firm of Detrick & Harvey, and with increased facilities will continue the manufacture of the open side iron planers, machine tools, special and general machinery.

New buildings are being erected at Hoboken, N. J., for the W. & A. Fletcher Company and will be finished in April. The machine shop will be 196 x 70 feet and fitted with large improved tools, including a powerful traveling crane. The boiler shop is to have a complete hydraulic plant.

The Baldwin Locomotive Works, Philadelphia, have begun work on an order for 75 locomotives for the Northern Pacific road. The railroad company have just placed a large order for equipment at the Pullman shops.

The Westinghouse Machine Company, of Pittsburgh, have received an order through their agency at Copenhagen, Denmark, for one of their now famous automatic compound engines. The size selected is 14 and 24 x 14 and it will be used at Kopparbergs Bergslaget at Falur, near Stockholm, Sweden. Large numbers of these engines are now being shipped to foreign countries.

Hardware.

On Monday, the 20th inst., the Braddock Wire Company, of Rankin, Pa., manufacturers of wire rods, plain and barbed wire, let a contract for the erection of a wire nail mill. The building will be 90 x 470 feet, and will be built of stone and brick. The contract calls for the completion of the plant on May 1 next, and it will have a capacity of 1500 kegs of wire nails per day. This firm at present turn out about 200 tons of wire rods per day, part of which is used in the production of wire and the balance sold in the open market. Upon the completion of the wire nail factory the entire product of rods will be used in the manufacture of nails and barbed wire. The officers of the company are as follows: Wm. Edenborn, president; J. W. Gates, vice-president; Wallace H. Rowe, secretary, and Charles H. Rowe, treasurer.

The circular issued by the Clauss Shear Company, Fremont, Ohio, announcing the destruction of their factory by fire, to which we referred in our last issue, states that the works will be rebuilt at once and that they hope to be in position to fill orders again in April. At the time of the fire the factory was crowded with orders and the company's prospects are referred to as exceptionally bright. The capacity of the new works will be double and the facilities for filling orders greatly increased. They suggest that their customers as far as possible hold their orders until the new factory is started.

The Tunnel Copper and Brass Works, of Chicago, have been incorporated, with a capital of $20,000, to manufacture and deal in copper and brass goods. Incorporators are A. W. Bulkley, E. E. Gray and A. N. Eastman.

The works of the Freeman Wire and Iron Company, East St Louis, Mo., were almost entirely destroyed by fire on the 22d inst., a part of the warehouse, which contained a large amount of manufactured stock, being saved. The estimated loss is $125,000 and the insurance $60,000. The company have been running night and day and employed a double force of about 200 men. The erection of new works will be undertaken at once and the contemplated plant will be larger and more complete than the establishment now in ruins.

Miscellaneous.

A dispatch from Connellsville, Pa., under date of the 22d inst., says: "Western furnacemen are endeavoring to buy coal land in this region and own and operate their own coke plants. They have an agent working in this vicinity, Morris Painter, of Greensburg. He tried to secure options on coal in the center of the region. The furnacemen wish to obviate the loss attending the banking down of their furnaces when the workmen are on a strike and coke cannot be secured."

The Corliss Safe and Vault Door Company, of Providence, R. I., shipped during the past week to the Coal and Iron Bank, of Middleboro, Ky., one of their 36-inch burglar-proof safes. The safe was especially constructed for the order and weighed 11,500 pounds, somewhat above the regular weight of this size.

The National Pulley Covering Company, of Baltimore, have recently received their third order for their patent friction covering for pulleys from the Boone Mill Company, of Greenwood, Fla., and fourth from D. J. C. Arnold, manufacturer of brick machines, Newfoundland, Ohio, the latter informing them of the very successful use on the tight and loose pulleys of his machines, it adding very much to their effectiveness and success.

We have received a little pamphlet describing the R. Puhlman & Co's Vegetable Boiler Compound, for which Reilly & Deeley, of New York, are the sole agents. It is claimed that the use of this compound will not only remove all scale from boilers, but will permenently prevent the accumulation of scale. The pamphlet contains many testimonials from well-known manufacturers who have used the compound with most satisfactory results.

The Chapin Mining Company in 1889 raised nearly 600,000 tons of ore, two-thirds of which came up out of one shaft.

The Iron Age

New York, Thursday, January 30, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Pig Iron Statistics.

We print elsewhere the summary which accompanies the elaborate pig iron statistics just issued by James M. Swank, of the American Iron and Steel Association. The figures are particularly interesting at this juncture, when doubts concerning the early future of the trade have arisen in the minds of many producers and consumers. The increase in the production from the first half of 1889 to the second half was distributed according to fuel used as follows:

Pig Iron Production.

Fuel used.	First half. Net tons.	Second half. Net tons.	Total 1889. Net tons.
Anthracite..	918,611	1,001,743	1,920,354
Charcoal	306,780	337,520	644,300
Bituminous.	2,876,593	3,075,821	5,952,414
Totals... .	4,101,984	4,415,084	8,517,068

This shows an increase of 313,100 net tons. Now, the production of Bessemer pig rose from 1,582,758 net tons during the first half to 1,946,826 net tons during the second half, a gain of 364,068 tons. The absence of Michigan in the list of States producing Bessemer pig indicates that very little if any charcoal iron went into the Bessemer converter during 1889. It is therefore best to compare the combined make of coke and anthracite iron with the production of Bessemer pig. It rose from 3,795,204 net tons in the first half to 4,077,564 net tons in the second half. Here there is an increase of only 282,360 net tons, while the gain in Bessemer pig was 364,068 tons. In other words, there was actually a decline in the production of coke and anthracite foundry and mill iron. Pennsylvania produced in the first half 2,008,902 net tons of coke and anthracite iron, and reached 2,156,389 net tons in the second half, an increase of 147,487 tons. But its product of Bessemer pig rose from 990,239 tons to 1,226,709 tons, an increase of 236,470 tons, which shows that the make of other kinds than Bessemer really declined. Ohio, on the other hand, gained, its total coke iron product advancing by 121,080 tons from 586,010 to 609,095 tons, while its Bessemer product increased by 51,662 tons from 200,492 to 252,154 tons. Taking now the group of Southern States producing nearly exclusively pig iron not suitable for steel making, Virginia, Alabama, Tennessee and Georgia, we find that the gain has been from 556,283 tons to 636,821 tons, or 80,538 tons. Taking, on the other hand, New York and New Jersey, leaving out of consideration the small quantity of spiegeleisen made by the latter, we find that the production of all kinds of coke and anthracite pig rose from 200,725 tons to 203,131 tons. But when we deduct the production of Bessemer pig we find a decline in the make of forge and foundry iron from 157,546 tons to 145,359 tons. Is it fair to draw from these figures the conclusion that the South and Ohio are wrenching from Eastern Pennsylvania, New York and New Jersey a part of its trade in these classes of iron?

Mr. Swank's statement of unsold stocks in the hands of makers or their agents will cause some surprise, because it shows a heavy reduction since midsummer, having declined from 563,286 to 277,401 net tons. Leaving out the stocks of charcoal iron, we have a falling off in anthracite and coke pig stocks from 412,898 tons to 164,274 net tons, or only about one week's make of these kinds of iron. In addition thereto of course considerable supplies of pig iron are being carried by rolling mills and steel works. Only lately the fact was announced that in the West the January statement showed a large increase in the stock of iron. It was explained, however, that it was in the hands of the steel works. A leading steel manufacturer has called our attention to an explanation of this fact which will quickly carry conviction with it. Many of the steel works and rolling mills have been idle for repairs, &c., during the holidays, so that they have melted less iron than usual. But the furnace-work of course goes on, so that they naturally accumulated iron. When it is considered that there are concerns using weekly over 10,000 tons of iron, it will be understood how the stoppage even for a brief period adds to stocks.

The majority in the iron trade have lately expressed doubts of the inability of consumption to take care of the present enormous output of iron. There are not wanting experienced men, however, who take quite a different view of the situation. They claim that we will soon discover that we are not making iron enough to cover our requirements and that we will find ourselves in a position very similar to that of some of the foreign markets. We are running perilously near our full capacity now. They urge that the slight reaction of the past few weeks is only a temporary stoppage to take breath, and that a further upward movement is before us in the near future.

We do not agree with Mr. Swank on one important point. He draws from his statistics the inference that the large production of 1889 was better distributed throughout the year than "the public has been erroneously led to believe." Practically, the production began to increase greatly in September, and has been advancing by leaps and bounds since then, checked only at times by scarcity of fuel. The increase in the production of the second half of the year over the first six months was really made in the last quarter. The December product pretty clearly shows this. Reports from 279 furnaces return December product of 665,007 gross tons. We estimate the make of the others in blast, based on frequent records of monthly product, with a few exceptions, at 75,000 tons. This indicates a make of 740,000 gross tons. If this rate of product can be maintained over 1890, and it is actually larger now, the product for this year will be very close to 8,900,000 gross tons. There is nothing more startling in this than was the increase from 4,044,526 gross tons in 1885 to 5,683,329 gross tons in 1886 or from 6,489,738 gross tons in 1888 to 7,604,525 gross tons in 1889. We feel convinced that as a matter of fact the United States is to-day producing more pig iron than Great Britain, and that, barring accidents, strikes or other causes, the United States will in 1890 produce more pig iron than Great Britain, if the statements which reach us from the other side are correct, that the scarcity of raw materials will not allow of the blowing in of very many furnaces.

Trade in Old Steel Rails.

Old steel rails are becoming more and more an important factor of the trade in old material. It is estimated by well-informed Western dealers that fully one-third of the entire volume of sales of old rails can now be credited to the steel element. This is, of course, a natural result of the substitution of steel rails for iron in renewals of track, which has been in progress for 20 years. Since 1882 very few new iron rails have gone into the railroad tracks of the country. Yet this increased supply of old steel rails, although it is constantly growing, hardly comes up to the expectations of the trade, based on the statistics of steel rails in use. The supply of old iron rails likewise holds out better than there was reason to expect. Taking the bare facts into consideration, it is less remarkable that the sales of old steel rails should comprise one-third of the total old-rail sales than that old iron rails should at this late day constitute two-thirds of the total. The cause of this peculiar state of affairs is probably that both iron and steel rails wear much better and last longer in actual service than they are theoretically capable of enduring. The iron rails laid are therefore coming up less rapidly than might have been expected, while the steel rails laid are also proving quite long-lived. As iron rails practically ceased to be laid eight years since, the present supply of old iron rails comes from tracks laid long before that time and bids fair to continue for an indefinite period. If iron rails were very short-lived we should ere this have seen an avalanche of old iron rails on the market, followed by their almost complete disappearance from commercial transactions. In the same way, if steel rails had a life of but 10 to 12 years the supply of old steel rails would have been very large for some time past. As conditions now exist, however, the manufacturers who find old iron rails best adapted to their purposes seem to be reasonably sure of the future and are not seeking something to take their place, while the consumers of old steel rails at the same time find the supply growing very gradually.

Thus far old steel rails have not attained the same commercial value as old iron rails, the difference between the prices of the two commodities ranging from $1.50 to even $8 per ton, according to the peculiar conditions prevailing at the time. This difference in value is plainly caused by the greater adaptability of the old iron rail to a variety of processes of manufacture. Old steel rails must be used for special purposes. The same thing, however, is true of scrap steel as compared with wrought scrap iron, the restricted use of the former causing its price to be almost invariably much below that of the latter, although its intrinsic value may really be higher to the manufacturer who can use it. Taking the range of prices in the Chicago market for the past four years,

we find the following comparison of old iron rail prices with those for old steel rails. Short lengths for the latter are taken, because long lengths or selected rails generally command a special price and are almost a separate article of merchandise.

		January.	April.	August.	Octob'r.
1886	Iron....	$23.00	$21.00	$21.00	$24.00
	Steel...	19.00	19.50	18.50	21.50
1887	Iron....	25.00	25.00	25.50	23.50
	Steel...	22.00	22.00	21.00	18.50
1888	Iron....	20.50	20.50	20.00	24.00
	Steel...	18.00	18.00	18.50	19.00
1889	Iron....	22.50	20.50	21.50	25.00
	Steel...	14.50	14.00	14.00	19.00

Latterly the price of old steel rails has been enhanced very considerably by the demand from steel works for material for remelting, and short pieces have sold at nearly as high rates as long lengths. Old steel rails have thus participated equally with scrap steel in the improvement caused by the recent heavy movement in steel products of all kinds, and the increase in the supply of such material seems to have been very timely, as so often proves to be the case in these movements of trade. Not many years since there were quite a number of the leaders in the iron trade who had serious misgivings as to what might happen when the steel rails then beginning to be laid in large quantities should wear out and be thrown on the market. They thought that if no use could be found for them, as it was impossible to reroll them, like iron rails, the sale of new steel rails would receive a severe setback, as the railroad companies would refuse to buy a material having no value whatever when unfit for track service. That problem happily solved itself with the advance of time and through the enterprise of American manufacturers, ever on the watch to utilize waste materials.

New York Bridge and Tunnel Projects.

As by a common impulse, immense tunnel and bridge projects for New York are being brought before the public from various quarters, some of them old schemes revived, others lately heard of for the first time. The projectors are able to discern the time, now not very remote, when New York City will be connected by costly bridges and tunnels with all its environs. As the center of the commercial system of the United States, whatever obstacle may interpose to check direct and speedy communication with all regions external to itself will be overcome. Through the triumphs of modern engineering and the accumulation of wealth all difficulties vanish.

To De Witt C. Haskins belongs the credit of initiating the first Hudson River tunnel enterprise. The work is still going forward, deterred neither by disaster nor financial embarrassment, because he and eminent engineers and financiers have faith in it. At the present day, after the lapse of eight years, tunnel schemes of like nature are talked of, accompanied by vigorous demonstrations on the part of their projectors, all eager to enter the arena of intended exploits, sanguine of success. Of capital, they positively affirm, there is no lack. The certificate of incorporation of the East River Tunnel Company was filed 16th inst. The tunnel will be built under the East River from South Seventh street, Brooklyn, to Broome street, New York, a distance of three-fifths of a mile. It will be constructed on the Henning gravity principle, with a sharp incline at each end. A train of cars entering the tunnel and descending the incline will acquire momentum enough to carry it two-thirds the way up the incline at the other end, a cable being used to finish the trip. It is expected that the trip can be made in one minute, and that 16,000 people can be carried in an hour. The cost of construction has been estimated at $3,000,000.

Still another project, the outgrowth of a previous attempt to tunnel the East River, is designed to supply close connections between the Long Island Railroad and the Vanderbilt system of roads, and a company has been organized to execute this purpose, known as the New York and Long Island Railroad Company. It does not appear that the Vanderbilt interest is directly concerned or has even been consulted beyond yielding its consent to the tunneling of Forty-second street, in order to approach the Grand Central Depot, although the plan contemplates a connection with the west side line of the New York Central Railroad, at Eleventh avenue. The tunnel across the city from river to river will be cut in the solid rock, 26 feet high and 24 feet wide, with double tracks. The motive power to be used has not been determined. Where the tunnel will emerge on Long Island is not divulged, from motives of policy, as such information might prejudice the interests of the company in acquiring real estate. It is assumed, however, that the terminus will be near Long Island City. About two years will be consumed in prosecuting the work, and the cost is estimated at $5,000,000. Mr. Bogart, the State Engineer, is quoted as saying that the enterprise is "very honest, practicable and well conceived."

A second East River bridge is on the tapis, not to mention the proposed bridge at Blackwell's Island. The general scheme is contained in the bill of Senator McCarron, of Brooklyn, presented to the Legislature a week ago. It provides for a structure between Grand street on this side of the river and Broadway in Brooklyn. The intermediate channel is narrow, an important consideration as affecting the cost. It is stipulated that the bridge shall be at least 130 feet above high water, that the pier line shall not be encroached on and that owners of land shall receive full compensation for any damage inflicted The proposal that the two cities shall share equally in the expense, which is set down at the very respectable sum of $15,000,000, may excite controversy. The mayors and comptrollers of the respective cities, associated with a commissioner named by each, shall assume control of the work. Irrespective of possible flaws in the method prescribed, there can be no question of the growing necessity for another bridge.

The $15,000,000 suspension bridge which Mr. Lindenthal proposes across the North River is still in embryo, but he claims that plans have been well matured and that the practical business guarantee of men who have money to invest has been obtained.

Lastly we have the scheme of the Peoples' Rapid Transit Company, to supersede Mayor Grant's project, comprising a four-track viaduct railway from the Battery to Spuyten Duyvil; thence a two-track line to Tarrytown. Application to the authorities will be made in a few days, so it is reported, for permission to commence the work. It is intended to build the road through blocks and to cross the streets upon brick and stone arches at an average elevation of about 60 feet. The two center railway tracks will be used for express traffic and the side tracks for carrying local passengers. In the arches it is proposed to build stores, tenements, &c., according to the localities through which the road may run. Before the work is finished Mr. Gould will have the opportunity to disburse some portion of the funds raised under a $40,000,000 blanket mortgage in extending the Manhattan L, in the interest of local traffic. Fifty years hence the environs of New York will be transformed almost beyond recognition.

The list of modern improvements would hardly be complete without some reference to the elevated tracks at ferry crossings on the North River side, to correspond with the system to be introduced by the Pennsylvania and Jersey Central Railroad companies when their preparations are sufficiently matured. Permits have been granted for the erection of bridges at the foot of Cortlandt and Liberty streets.

Profits of Lake Superior Iron Ore Mining.

The iron ore mining companies of the Lake Superior region are now reaping enormous profits. It is reported from Milwaukee sources that the largest dividend ever paid by a mine on the Gogebic range has just been declared by the Metropolitan Iron and Land Company, who are owners of the Norrie, Pabst and other mines. The dividend is $6.50 per share. The capital stock of the company is $2,000,000, divided into 80,000 shares of a par value of $25. A dividend of $6.50 per share therefore means the distribution of $520,000 among the stockholders, which is over 25 per cent. of the capital stock. This is a remarkable showing for one year's business. It is not surprising that the market value of the stock is now close to $75. Moreover, the prospects are most excellent for a still larger dividend on the operations of the coming year. The company's mines will greatly increase their output, and a very large part of it has already been sold at an advance on last season's prices. Unless an unforeseen revulsion should occur in the trade or mining operations be seriously impeded by some accident, the year 1890 will be the greatest in the company's history both as to production of ore and net results to stockholders.

There are several other large mining companies in the Lake Superior district that have paid their owners almost if not quite as heavy proportionate profits on the business of 1889. The year was unusually satisfactory in almost every respect, differing very materially from the experience of the iron and steel manufacturers who consumed the ore. The mining companies were favored with a demand which increased in volume as the season advanced, and prices were strong from start to finish, while the pig iron smelted from their ores

never before sold so low as it did during part of the same year. The iron and steel manufacturers enjoyed a fairly prosperous season during the latter half of the year, but their annual balance sheets will undoubtedly show a very much smaller proportionate profit on the 12 months' business than those of the Lake Superior mining companies. Even the newer mines, which are just entering the field as shippers, expect to return huge profits to their owners on the output of 1890. A dollar a ton is quite a reasonable expectation among them. Of course the older companies, with a few exceptions, are looking forward to larger returns. Those possessing their own lake carriers will absorb additional profits in that direction as compared with the usual cost of transportation to lower lake ports. Ownership of a Lake Superior iron ore mine would appear to be more enticing than ownership of an iron or steel plant.

Yet these large profits, satisfactory as they may be to present holders of mining stocks, are the weakness of the ore-mining interests. Never were prospectors busier in searching for new ore bodies, and seldom have more vigorous preparations been made by mine operators to get out an increased output than now. Within the next two years the number of active mines will be greatly increased, and with that increase a much heavier production can also be looked for from the old mines. Conservative mine owners—particularly those operating in non-Bessemer deposits—have felt some apprehension lest more Lake Superior ore should be offered this year than the market can absorb. At present, it is true, the indications are that every pound of ore mined will be needed to supply the demand, but the expansion in production of which the Lake Superior region is capable cannot be definitely measured, and those who count on a shortage of ore before the close of the shipping season may find a surprise in store for them. The Lake Superior region is no longer a wilderness, penetrated by one or two railroad lines on whose grace the development of promising ore deposits might depend, but almost every part of it can now be reached by rail, and the railroad managers are helping mine owners in order to get paying traffic. Hence the expansion of production promises to follow rapidly on the heels of the ore prospectors, and the requirements of the country can hardly fail to be overtaken at an early day. The large profits of the mine owners will then shrink to more reasonable dimensions and be less dazzling to the eyes of those who transmute the ore into forms of utility.

Our Petroleum Exports in 1889.

Statistics of our last year's petroleum exports are published, and by reducing quantities to thousands of gallons we have condensed the statistics to the table given below. What they reveal is most gratifying, inasmuch as it completely upsets the impression that had been gaining ground that we were losing our foothold in the far East, a most important quarter, and that Russian oil was displacing ours at an alarming rate. The contrary is the case. The great population of East India takes to refined petroleum more kindly every year, and soon they will burn nothing else, because it combines excellence of quality with cheapness. Thus a practically unlimited market is being opened. The countries where Russian petroleum competes easiest with ours are the very ones where we show the greatest increase. By reference to the first table it will be found that the increase there was as follows:

	1889.	1888.
Mediterranean countries	6,856	4,899
British India and Siam	41,034	24,227
China and Japan	40,470	29,027
Sunda Islands, Straits and Philippines	38,055	21,424
Totals	126,415	79,577
Increase	59 per cent.	

It is indeed all the better for the magnitude of this trade that we encounter in the East a well organized Russian competition which keeps prices at a moderate level and renders it accessible to the most modest purses in densely populated countries, leaving room enough for both American and Russian refined. The petroleum shipments from New York, was as follows in thousands of gallons:

Refined.

To	Calendar years. 1889.	1888.
England	57,320	48,711
Germany	82,760	88,450
Norway, Sweden and Finland	4,064	3,217
Denmark	2,579	2,352
Belgium	28,607	35,607
Holland	34,619	24,422
Mediterranean countries	6,856	4,899
British India and Siam	41,034	24,227
China and Japan	40,470	29,027
Sunda Islands, Straits and Philippine Islands	38,055	21,424
Africa	8,099	3,258
Australasia and Sandwich Islands	5,454	8,545
Spanish America, Brazil, British West Indies and Guiana	24,431	25,373
Canada	1,725	1,996
Totals	376,073	321,508

Crude.

France	38,024	30,485
Belgium	.....	817
Germany	1,288	.....
Spain	6,524	8,222
Norway and Sweden	2,026	1,979
Cuba	3,426	3,289
Other countries	3,345	.....
Totals	54,633	44,792

Naphtha.

England	5,140	4,185
France	3,614	2,230
Germany	1,661	525
Rest of Europe	1,119	690
Other countries	59	24
Totals	11,593	7,654
Total crude equivalent	553,901	471,628
Philadelphia	209,320	166,380
Baltimore	11,115	6,836
Boston	6,107	4,694
Perth Amboy	22,200	21,612
St. Louis by rail to Mexico	2,200	2,000
Grand totals	804,846	673,150
Russian from Batoum, 11 months	166,741	129,360

The growing magnitude of our East India petroleum trade has the additional advantage of giving our large sailing vessels engaged in the traffic, and their number is great, a handy, clean article of freight, easily stowed, on their outward trip. It would, indeed, be difficult to find an article to take its place for the purpose.

Pieces of tin plate made at the Pittsburgh exposition building have been sent to each member of Congress in refutation of the statement made that tin plate cannot be made in this country.

CORRESPONDENCE.

Monopolies and Trade Combinations.

To the Editor: I notice in your issue of January 2, a criticism of my recently published book, "Monopolies and the People," which seems to give a somewhat unfair statement of my position regarding monopolies, especially those combinations in trade with which the readers of *The Iron Age* are most familiar. You allude, in the first place, to the partisan and sensational manner in which the subject of monopolies has been treated by the daily press and by political speakers, in which I fully agree with you. You imply, however, that I have discussed the subject in the same spirit of uncompromising hostility to monopolies which actuates the editors and orators above referred to, and that I have joined in "preaching crusade" against monopolies. Now a chief purpose of my book is to prove that monopolies are daily growing more necessary in modern trade and industry, and that instead of punishing their makers with imprisonment, as has been proposed in several State Legislatures, monopolies should be so regulated by the Government as to preserve at once the rights of their owners and of the public. It was my desire in writing the book in question to state the arguments on the side of the monopolists as fully and candidly as I did those on the side of the people; and of the many reviews which have appeared, yours is the first to accuse me of unfairness in my treatment of the subject. I have been really surprised that my defense of the unpopular side—the monopolist's—has been so generally accepted as a fair statement, even by the extremists. I am no less surprised, however, that my attempt to show that the men who are forming trusts and trade combinations are no worse after all than the average of humanity, should be classed by *The Iron Age* in the same category with the crusades against monopolies which are preached by earnest though misguided men.

In the second place I am criticised in regard to my statement of facts, and it is intimated that those I have presented are gathered from the newspapers. I may state in regard to this that, while many of the facts which I have presented were verified by personal interviews, my most reliable informants, I believe, were the trade journals, especially *The Iron Age*. In your criticism of my book you enumerate coal, steel, steel rails, steel and iron beams, wrought-iron pipe, iron nuts, stoves, coke, lead and copper as articles whose production I have claimed to be in the hands of trusts, and you deny that the trade associations which may exist in any of these industries amount to anything, except in the case of rolled beams.

If you will read somewhat more carefully my statement on page 23 regarding this matter you will see that I quoted the list above from Mr. W. W. Cook's book on "Trusts," and I plainly stated that, "as regards most of the combinations the public knows little beyond the fact that some form of combination to restrict competition has been formed." I am quite ready to admit that in several of the above-mentioned industries no combinations of importance at present exist; and that in other industries, such as the anthracite coal trade and the coke trade, the combinations at the present time are doing no more than secure the companies a fair price for their product. But I am not at all willing to recede from my position as stated immediately following the list from which you quote above.

"The salient facts are that among the manufacturers of this country there has arisen a widespread movement to partially or wholly avoid competition in the pro-

duction and sale of their goods; and that in a very great number of manufacturing industries these combinations have progressed so far that their managers have been able to advance prices and check production."

Certainly, in this position *The Iron Age* will agree with me, since the records of a much larger number of trusts and trade combinations than are mentioned in my book can be found in its own columns. For instance, in the issue for January 2, in which appeared the review of my book, I find the following notes:

"The manufacturers of white enamel and tinned hollow ware, such as maslin kettles, boilers and sauce pans have advanced prices 5 per cent., to take effect January 1."

"It was decided at Pittsburgh, December 28, that prices for the coming month for coke will not be advanced. A few operators, it is understood, desired that prices should be increased, but H. C. Frick was opposed to any change."

I will not take the space to quote longer extracts relating to a conference between the Eastern Bar Iron Association and the Western Iron Association to the consolidation of three competing steel companies at Chicago, and to the table of manufacturers' standard list prices, adopted December 18, 1889, for bolts and nuts.

I do not make the mistake which many writers for the daily press make of classing these various combinations and associations as trusts. I am aware that in many cases, perhaps in all but one of those to which the above quotations refer, competition is merely restricted and regulated. But this restriction and regulation are certainly facts worthy of note by a careful student of economics, especially when it is seen that the constant tendency is for the combination to be made closer and more binding; and what begins as a manufacturers' association for the collection of statistics, like that in the steel rail trade, may in the end become an actual consolidation, as has been the final result with the Cotton Seed Oil Trust.

As regards my statements that "the true remedy for the evils of monopoly is not abolition but control," I am pleased to see that you agree with me as far as the monopolies dependent on natural agents and on franchises granted by the public are concerned, although you dissent as regards monopolies in trade and manufacturing. Doubtless without so intending, you give your readers the idea that I am in favor of Government control of trade and manufacturing. I do not understand whether you yourself think the present state of affairs is all right or whether the Government ought to interfere to keep competition alive, but my position in the matter is briefly as follows:

It seems to me that the present activity in the formation and dissolution of combinations is seriously injuring our standards of business morality. It is perhaps not generally realized that every contract or agreement to restrict competition is illegal and cannot be enforced at law; but it certainly cannot be a good thing to have a great proportion of our leading business men binding themselves by such contracts and agreements, and deliberately breaking them before the ink on their signatures is dry.

Now, with modern business methods our great need is to raise our standards of business integrity rather than lower them. We have quite enough of defalcations and speculation by those entrusted with other people's money; and certainly if it is to be taught and practiced that it is right to make illegal contracts and honorable to break them, it will seem to many young business men that such illegal acts as privately borrowing trust funds to speculate with are quite in accord with the popular code of business ethics.

For the sake of the makers of trusts and combinations as well as for the sake of the public, therefore, I say let me have no more of these illegal and non-enforceable contracts. If you wish to make a contract in restraint of competition, let the law provide that it shall be made public and shall be enforceable. If your combination is of such extent that you and your association have made yourselves a necessary servant of the public, then let the law provide that you shall be bound by the rules which govern other necessary servants, such as common carriers and inn keepers, and which oblige them not to practice discrimination or extortion upon their patrons.

This is the manner in which the Government control of monopolies in trade can best be effected, it seems to me, and I submit that the plan interferes with no vested rights and is far more just to those who manage our industrial affairs than the laws recently proposed by some of our legislative solons which would make every agreement in restraint of competition a penitentiary offense. Very truly yours,

CHARLES WHITING BAKER.

TRIBUNE BUILDING,
NEW YORK, January, 23, 1890.

Our Production of Pig Iron in 1889.

In a supplement the *Bulletin* of the American Iron and Steel Association presents complete statistics of the production of pig iron in the United States in 1889, as follows:

The total production of pig iron in the United States in 1889 was 7,604,525 gross tons, against 6,489,738 gross tons in 1888—an increase of 1,114,787 gross tons, or over 17 per cent. Reducing gross tons to net tons, our production in 1889 was 8,517,068 net tons, against 7,268,507 net tons in 1888. When it is remembered that our production in 1888 was the largest in our history down to that time, the magnitude of our production in 1889 will be more fully comprehended.

The enormous production of 1889 was better distributed throughout the year than the public has been erroneously led to believe. The production of the first half of 1889 was 3,662,486 gross tons and the production of the second half was 3,942,039 gross tons—an increase in the last half of 279,553 gross tons. The increased production in the second half of 1889 was wholly due to the increased demand for Bessemer pig iron.

The stocks of pig iron which were unsold in the hands of makers or their agents on December 31 last, and which were not intended for the consumption of the manufacturers, amounted to only 277,401 net tons, against 336,161 net tons at the close of 1888. There was, however, an increase in stocks during the first half of 1889, the figures on June 30 amounting to 563,286 net tons. There was, therefore, a considerable decrease in stocks in the last half of the year. In addition to the stocks above noted, the American Pig Iron Storage Warrant Company advise us that at the close of 1889 there were 36,200 gross tons, or 40,544 net tons, of pig iron in their warrant yards.

The production of pig iron in 1889 according to the fuel used was as follows, compared with the production of the two preceding years:

Fuel.	1887. Net tons.	1888. Net tons.	1889. Net tons.
Bituminous	4,270,635	4,743,989	5,952,414
Anthracite and coke.....	1,919,640	1,648,214	1,575,996
Anthracite alone	418,749	277,515	344,358
Charcoal.....	578,182	598,789	644,300

Nearly all the leading pig iron producing States shared in the increased production of 1889 over 1888. Pennsylvania shows the largest actual gain, with Alabama next, Pennsylvania's increase over 1888 being 592,056 net tons and Alabama's 341,933 tons. The great progress made by the entire South in the production of pig iron in the last four years is shown in the following table:

States.	Net tons. 1886	1887.	1888.	1889.
Alabama.....	283,850	292,762	449,492	791,425
Tennessee.....	199,166	250,344	207,931	294,655
Virginia.....	156,250	175,715	197,396	251,356
West Virginia.	98,618	82,311	95,259	117,900
Kentucky.....	54,844	41,907	56,790	42,518
Georgia	46,490	40,947	39,397	27,550
Maryland.....	30,502	37,427	17,600	33,847
Texas.....	3,250	4,383	6,587	4,544
North Carolina	2,200	3,640	2,409	2,898
Totals.....	875,179	929,436	1,132,858	1,566,702

There has been a gratifying increase in the production of spiegeleisen in 1889, the production being 86,812 net tons, against 54,769 tons in 1888.

Much has recently been written about the possibility of our overtaking Great Britain in 1890 in the production of pig iron. It has been assumed that we would certainly do this; indeed, that we are now producing at a more rapid rate than the mother country. The following comparative figures will throw some light on this subject:

Years.	Great Britain. Gross tons.	United States. Gross tons.
1882.....	8,585,680	4,623,323
1883.....	8,529,300	4,595,510
1884.....	7,811,727	4,097,868
1885.....	7,415,469	4,044,526
1886.....	7,009,754	5,683,329
1887.....	7,559,518	6,417,148
1888.....	7,998,969	6,489,738
1889 (estimated for Great Britain)...	8,300,000	7,604,525

We do not think that we will pass Great Britain in 1890 if trade conditions in both countries should continue as they now are. In 1889 we exceeded her production in 1887.

Uses of Electricity.

The increase in the use of electric lights and electric motors is shown by the *Electrical World* to be even greater during the past few years than most people probably imagine. The number of electric lighting companies in the United States and Canada operating central stations at the beginning of 1886 was 450. This number had increased at the beginning of 1887 to 750, at the beginning of 1889 to nearly 1200 and at the beginning of 1890 to 1277, including 25 in Mexico and Central America. Meantime 266 gas companies had engaged in electric lighting, so that the total number of companies engaged in electric lighting at present is 1543. The number of isolated or private incandescent and arc light plants at the beginning of 1887 was about 1000 each. Now there are 3925 private plants in the United States, 175 in Canada and 200 in Mexico and Central America, making 4300 in all.

The number of arc lamps in use in 1882 was 6000. This number doubled each year for four years and has since grown rapidly until there are now 235,000 arc lamps in use. The number of incandescent lights has increased from 525,000 in November, 1886, to 3,000,000 at present. The number of electric motors now in operation in the country is estimated at 15,000, many of them from 15 to 50 horsepower. There are nearly 200 electric railways in over 125 towns and cities, and these have in operation or under contract 1884 cars on 1260 miles of track. These motors find their greatest application in connection with electric light plants. Electricians, however, look for a great development of electric motors for railroads of all kinds during the next two years. Electric light and electric power for mining is a new development of considerable promise. The electric tramway and electric power for pumping, drilling, cutting, &c., have already been adopted to some extent with good results.

The Davis-Colby Roasting Kiln.

At the Ottawa meeting of the American Institute of Mining Engineers Dr. Sterling G. Valentine, of Lebanon, Pa., presented a paper on the Davis-Colby ore roasting kiln, giving a brief historical sketch of its development and drawings and a description of the kiln.

Some analyses are appended to show results obtained in actual practice with the Davis-Colby roaster.

Excellent results have been obtained in working on Katahdin, Maine, ore, which is very open and porous and well adapted to roasting. The following table shows its composition when raw:

Raw Katahdin Ore.

	I.	II.	III.	IV.	V.
Iron	47.75	57 34	44.80	39.50	58.50
Phosphorus	0.017	0.025	0.04	0.035	0.034
Sulphur	3.90	1.29	0.98	2.80	2.48

The roasted ore contains the following percentages of sulphur:

	1.	2.	3.	4.	5.	6.
Per cent. sulphur.	0.07	0.15	0.10	0.18	0.12	0.10

The roasted ore runs, as a rule, from 0.05 to 0.20 per cent. of sulphur, averaging not over 0.10 to 0.12 per cent.

Cornwall, Pa., ore, containing on an average from 2½ to 3½ per cent. of sulphur, gives the following results when treated in Gjers kilns:

Cornwall Ore Roasted in Gjers Kilns.

Per cent. Total sulphur.	Per cent. Sulphur as sulphate.	Per cent. Sulphur as sulphide.	Per cent. Total sulphur as sulphate.
1.133	0.283	0.850	24.977
1.380	0.135	1.245	9.782
1.873*	0.096	1.777	5.125
0.860			
1.410			
1.050			
1.120			

* Samples of clinkered ore.

The same ore roasted in the Davis-Colby kilns shows results as follows:

Cornwall Ore Roasted in Davis-Colby Kilns.

Per cent. Total sulphur.	Per cent. Sulphur as sulphide.	Per cent. Sulphur as sulphate.	Per cent. Total sulphur as sulphate.
0.577			
0.779			
0.674			
0.666*	0.533	0.133	19.96
0.602	0.497	0.105	17.44
0.398			
0.697			
0.782	0.358	0.424	54.21
0.798	0.480	0.318	39.85
0.596	0.315	0.281	49.14
0.740	0.534	0.206	27.83
0.850			

* Samples of clinkered ore.

As being of interest in this connection the following results are given as obtained by another type of gas-fired roaster, the Taylor kiln, on magnetite ores from the Jones Mine, Berks County, Pa. This ore is similar to Cornwall ore and carries about the same amount of sulphur. The analyses are by R. H. Voudy, of the Phœnix Iron Company, and the roasting was done in their kiln:

"Jones" Ore Roasted in Taylor Kiln.

Per cent. Total sulphur.	Per cent. Sulphur as sulphide.	Per cent. Sulphur as sulphate.	Per cent. Total sulphur as sulphate.
1.067	0.656	0.431	48.85
1.059	0.552	0.507	47.87
1.045	0.618	0.427	40.86
0.912	0.548	0.364	39.91
0.909	0.444	0.465	51.15

As to the ability of the Davis-Colby roaster to dispose of fine ore, it may be well to state that when properly charged as much as 30 to 40 per cent. of fine ore can be used. But fine and coarse should be thoroughly mixed in filling, as a solid mass of fine ore before a fire-arch chokes off the gas and prevents the heat and air from penetrating the ore. Kilns of the size shown in the illustrations roast from 75 to 100 tons of a reasonably porous ore in 24 hours. Of course a hard, dense ore requires a longer exposure and the output of such ore is somewhat less. The roaster at the Katahdin Furnace, 20 feet high and 15 feet in diameter, roasts about 40 tons per day, the entire supply for the furnace. The kilns at the Colebrook furnaces and Cornwall anthracite furnaces, as shown in the illustrations, roast from 75 to 90 tons of Cornwall ore per day.

The occurrence of clinkers in this roaster causes little difficulty in working. They are local, seldom extending beyond the bounds of one or two fire-arches, and as the annular space is so narrow and widens downward, they are readily reached and broken up while hot. Indeed, with proper attention, there is no reason why clinkers should be allowed to form at all, owing to the easy and full control of the heat. But carelessness of men in charge will sometimes bring about that result. The upper fire-arches should generally be kept at a somewhat lower temperature than the second set, gradually raising the ore to the desired heat as it descends, so that if clinkering does take place it is only after long heating at a lower temperature and after atmospheric oxygen has had full play on the reasonably hot ore. It is seldom necessary to sinter an ore in roasting, but if it is done it should be the final act of the process, as it renders further effective roasting impossible.

The cost per ton of roasting ore in this kiln varies with the circumstances and it is scarcely possible to give figures. The cost is greatly affected by the method of breaking and filling the ore and by the use of furnace or produce gas.

New kilns with a capacity of 75 to 100 tons per day are built by contract for $3000, including royalty. But the system can be adapted to any ordinary Gjers kiln, the expense varying with the size and shape of the original roaster.

A committee of French rolling-mill owners has just published an interesting list of the iron used for the buildings of the Paris Exhibition:

Machine Hall	Kg. 12,761,063
Industry Hall	8,337,679
Pavilion of Fine Arts	8,027,440
Eiffel Tower	8,439,230
Gallery of Agriculture	788,916
Pavilion for Mexico	607,000
Pavilion for Argentina	600,000
Pavilion for Chili	265,000
Pavilion for Paris	180,000
Hall for victuals	173,358
Ministry of Public Labors	152,000
Theater "Follies Parisiennes"	143,467
Pavilion for Brazil	142,000
Hall for Class 61	135,000
Pavilion for the iron works of the Nord	126,677
Pavilion for Uruguay	125,000
Pavilion for the gas works	118,000
Various buildings	843,674
Railroads on the Marsfield	1,010,600
Decauville Railway	300,800
Total	43,276,904

This figure is of interest as showing what the construction of exhibition buildings means to the manufacturers of structural iron.

In Colorado there are some 1100 canals, the primary canals measuring in length over 6000 miles, while the secondary canals are of still greater mileage. This system has brought "under ditch" 4550 square miles, or nearly 3,000,000 acres, of land.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 28, 1890.

The Committee on Ways and Means have fairly embarked in the preparation of the new Tariff bill. Thus far they are very closely adhering to the line of the Senate bill. In referring to this subject a member of the Committee on Ways and Means remarked that the measure prepared by the Senate would be an excellent guide, as it had been compiled by the Committee on Finance after long and careful inquiry among the representatives of the industries embraced in the different schedules. It had been framed with reference to the principles of the Republican party, and it was sustained by the dominant sentiment of the country as instanced in the vote of the National campaign of 1888, which was conducted upon the tariff issue and nothing else. The House bill, therefore, will not only be protective in every sense of the word, but will introduce a number of industries into the protected classes which have been permitted to languish under the rates of the act of 1883.

The revenue tariff champions have been very reticent since their experiences at the recent hearings. It was shown that but for the race question there would be a very pronounced protective sentiment in the industrial States of the South, and this cannot long be restrained by the arrogance of sentiment as against interest.

Many of the leading manufacturers of the State of Alabama, under the influence of the influx of Northern capital, have shown pronounced sympathy with the measure proposed by the committee.

No time has yet been fixed to limit the work of the sub-committee in the preparation of the bill, but it may be expected to come up before the General Committee at the earliest practicable moment. The parliamentary tactics which so promptly led to the passage of the Administrative tariff bill are very much applauded, and an application of the same decisive course will see the tariff and the internal revenue repeal bills carried through with the same expedition.

The Naval Committee, of which Senator Cameron is chairman, are having some interesting sessions. As a result of their inquiries, already mentioned in *The Iron Age*, the Naval Board have made an elaborate report, which has been adopted by the Senate committee. In it they make very important recommendations, based upon a policy of liberal naval construction and a proportionate degree of expenditure.

The report of the English accountants who examined the business of Fraser & Chalmers, manufacturers of mining machinery, at Chicago, report that the profits in 1886 were $197,225; in 1887, $225,792; in 1888, $338,162, and in the first ten months of 1889, $339,900. The assets of the concern are placed by them at $1,926,819.70.

A writer in the New York *Press* states that the balance sheet of the Woodward Iron Company, of Birmingham, Ala., a few months ago showed the total average cost to the company, including repairs, interest on capital invested, improvements, &c., of producing pig iron, had been only $8.36 a ton for the year just then ended. During one month of the year the average total cost had run down to $7.71 a ton.

A casting for one of the 16 cylinders to be made for the two new cruisers whose engines are building in the Brooklyn Navy Yard has been made in the yard foundry, and the officers say that it is a very fair piece of work.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, January 27, 1890.

Pig Iron.—The market is hardly as firm as it was a week since. Makers' prices have not been reduced, but a lower range of values is looked for if present conditions continue. A little stronger disposition to sell is manifested, while buyers are holding off. Yet furnaces are well sold ahead, and it might be supposed that makers would be content to wait for more business until the conditions were more propitious. It is a singular fact, however, that furnacemen are not satisfied unless they are so loaded with orders that they are embarrassed to make deliveries. There certainly seems to be no justification for anxiety beyond the accumulation of stocks at some Southern furnaces, which might lead to a break in prices in that direction. But the warrant system is expected to prove its value now, in affording Southern makers an opportunity to tide over financial necessities without demoralizing the market by large offerings of Pig Iron just when nobody cares to buy. The Pig Iron offered in this market by outside parties is being absorbed gradually, but at prices about $1 below our regular quotations. As they disappear and consumers find that such bargains cannot be duplicated, a firmer tone in the trade would not be surprising. But it rests entirely with the furnace companies themselves as to whether matters shall thus be shaped. Regular quotations are still as follows, for cash, f.o.b. Chicago:

Lake Superior Charcoal	$23.00 @	.....
Local Coke Foundry, No. 1	20.00 @	$20.50
Local Coke Foundry, No. 2	19.50 @	20.00
Local Coke Foundry, No. 3	18.50 @	19.00
Am. Scotch (Strong Soft), No. 1	21.25 @	21.50
Ohio Silveries, No. 1	19.75 @	20.00
Southern Coke, No. 1	20.75 @	....
Southern Coke, No. 2	20.25 @	....
Southern Coke, No. 3	19.75 @	....
Tennessee Charcoal, No. 1	22.00 @	22.50
Alabama Car Wheel	26.00 @	27.00

Bar Iron.—We are able to report a much better condition of this branch of trade. Large inquiries have been received as usual from car builders, but other buyers have reinforced their ranks, and quotations are now being asked by wagon-builders, plow-makers, &c. The local mills are still in command of the field, however, as the Mahoning Valley mills quote 1.80¢, half extras, at mill, or 1.95¢, Chicago, while the local manufacturers quote 1.90¢, half extras, for ordinary specifications. The situation has so far improved that a large car order was secured at 1.90¢ flat, although 1.85¢ continues to be the ruling rate. Small lots of Common Iron are still quoted at 2.1¢ @ 2.2¢ from store.

Structural Iron.—Architects' offices are loaded with building projects on which bids are being asked, so that the prospects are bright for a heavy consumption of Beams and other Structural Material in this territory.

Plates, Tubes, &c.—The Plate mills selling in this market are inclined to irregularity, being stiff on some grades and weak on others for early delivery, while very firm for futures. Carload lots from mill are quoted as follows: Nos. 10 to 14 Iron Sheets, 2.80¢ Chicago; Steel do., 3¢; Tank Iron, 2.70¢ Tank Steel, 2.90¢. Dealers report the volume of business fair, but not particularly heavy. Small lots from store are sold at the following rates: Nos. 10 to 14 Sheet Iron, 2.85¢ @ 2.95¢; Steel do., 3.15¢ @ 3.25¢; Tank Iron, 2.75¢ @ 2.80¢; Tank Steel, 3¢ @ 3.10¢; Shell Iron and Steel, 3.25¢; Flange Steel, 3.50¢, Fire-Box, 4.25¢ @ 5.50¢; Boiler Rivets, 4¢ @ 4.25¢; Norway Rivets, 40 %. A heavy advance was made in Boiler Tubes last week, 1¼ inches and smaller now being quoted at 45 % off, 2 inch to 4 inches at 50 % and 4 inch and larger at 52½ %. The manufacturers have further agreed that agents cutting these prices shall be refused a further supply of Tubes.

Sheet Iron.—Manufacturers' agents are still favored with a heavy volume of business in Galvanized Iron, and prices continue as previously reported, small lots of Juniata being quoted at 50 and 10 % to 60 % off. Black Sheets have shown some animation, but not very much. Mill lots of No. 27 Common Ore still quotable at 3.30¢, Chicago, while small lots from store sell at 3.40¢ @ 3.50¢, according to quantity.

Merchant Steel.—A decided improvement in trade was perceptible last week, which is partly attributable to the weather, although better buying from the railroads had much to do with it. Prices are very firm at 2.85¢, Chicago, for carload lots of Machinery, Toe-Calk and Spring Steel, and 3¢ @ 3.25¢ for small lots; Tire Steel and Soft Bars, 2.50¢ rates from store; Tool, 7½¢ and upward; Crucible Sheets, 7¢ @ 10¢.

Steels Rails and Fastenings.—Unless appearances are very deceptive, the railroad companies that have deferred making purchases of Steel Rails have made a great mistake. The local mills now ask $38 and make it their best rate for large lots. Inquiries are commencing to make their appearance Fastenings are in better demand. Iron Splice Bars are quoted at 1.90¢ @ 2¢; Spikes, 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.80¢ @ 2.85¢; Hexagon do., 2.95¢ @ 3¢.

Old Rails and Wheels.—Old Iron Rails are extremely quiet. Bidders name $25.50 as the outside price they are willing to pay, but holders refuse to come down so low. The Old Rail business is very uncertain, however, and a decided change may occur any day. Old Steel Rails continue active with a very steady demand. Short pieces bring $20 @ $20.50 and long lengths $21.50 @ $21.75. Old Car-Wheels are out of fashion at present, being held at $20 with no takers.

Scrap.—Nothing special has occurred in this line, but high-grade material is still weak. Dealers quote selling prices as follows, ℔ ton of 2000 lb: No. 1 Forge, $20. @ $21; No. 1 Mill, $16; Nos. 2 and 3 Mill, $11; Horseshoes, $19; Old Axles, $25.50; Fish-Plates, $22.50; Pipes and Flues, $15; Cast Borings, $10; Wrought Turnings, $14; Axle Turnings, $15; Stove Plate, $11; Machinery Cast, $14; Mixed Steel, $16; Leaf Steel, $19; Coil Steel, $18.50; Tires, $20.

General Hardware.—The demand for Shelf Hardware improves from week to week. Orders are coming in freely from every section of the territory served by Chicago jobbers. Collections are fair and about as good as usual at this time of the year. Heavy Hardware jobbers report a good demand for their specialties, but complain of the slowness of collections among their customers who deal directly with farmers.

Nails.—The demand for Wire Nails from heavy buyers has very decidedly increased, while at the same time elements of weakness among manufacturers have been pretty thoroughly obliterated. Manufacturers' agents quote $3, Chicago, as their present asking price. Cut Steel Nails, are quiet, with $2.50, Wheeling, the regular price, which is said to be reasonably well maintained. Jobbers quote from stock at $2.70 for Cut Steel and $3.15 for Wire, with 5¢ off for carload lots.

Barb Wire.—A nice trade is being experienced by jobbers, but most buyers ask for shipments in February, thus indicating their anticipation of stiffer prices. Small lots of Painted are selling at 3.35¢ and carload lots at 3.25¢, with Galvanized at 60¢ ℔ 100 lb more.

Pig Lead.—Less than 500 tons changed hands here last week, but values were well sustained at about 3.67½¢. At the close of the week 3.65¢ was bid.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., January 28, 1890.

The market has not developed any improvement in the Iron trade, but, considering the dullness, it is surprising how well prices have been maintained. There is some irregularity, of course, but in a general way business has been pretty generally done at quoted rates, and with a fair inquiry and prospects of greater activity after the turn of the month there is a feeling that the turning point is not far off. Still, the market will not stand much pressure, and unless for such orders as are offered it would be difficult to obtain full quoted rates. Under the various headings the market will be more fully considered.

Pig Iron.—Foundry grades are steady and in fair demand at about last week's quotations. Mill Irons are comparatively heavy, and to do business some rebate is found necessary, varying according to circumstances. There is some disposition to realize on Warrant Iron, and although several lots have been placed, it is difficult to give exact quotations, as terms, deliveries and qualities may have an important bearing on the value of the transaction. There are several similar lots on the market yet, but they are not likely to be taken, unless by large cash buyers, to whom price is more of an object than quality. To some extent, however, they have their effect on the general market, conveying the impression that there is some realizing going on, and that, to say the least, there is no danger of scarcity. Under these conditions consumers are not inclined to increase their lines at present, so that unless for material absolutely necessary there is very little business doing. In some cases makers would be willing to shade prices, but in the absence of bids it is felt to be good policy to maintain prices at the old figures, say $18, delivered, for Gray Forge, $19 for No. 2, and $20 @ $20.50 for No. 1. Most of the leading furnaces are well sold up, so that while the demand is small the offerings of standard qualities are also equally limited, and whatever element of weakness there is comes from outside rather than from legitimate sources. Everything depends on the turn of events within the next 30 days. As already stated, prices have held remarkably well so far, but the dullness is beginning to cause uneasiness, so that a renewal of demand or lower prices must be expected before long.

Bessemer Iron.—There is very little demand at present, as consumers largely covered their requirements some time ago. But the offerings are equally light, so that prices are unchanged—viz., nominally $22, at furnace.

Spiegeleisen.—There is a wide discrepancy between bids and offers, owing to a scarcity for all early deliveries. Buyers can be found at $38, c.i.f., duty paid, for 20 %; sellers at $40 @ $41. Ferro. sold in small lots at from $99 to $102 for 80 %, with limited supplies at $100.

Steel Rails.—There is a fair demand for small lots at from $35.50 to $36, and some inquiry from larger buyers, but the amount closed is not important. It is said that one or two lots of from 3000 to 5000 tons each were secured at about $35, but they are understood to have been resales,

and it would be difficult to place an order at any of the mills at the price named. The demand for Billets, &c., keeps the mills actively employed, so that there is less urgency for Rail orders than might otherwise be expected.

Billets.—There is a good demand for Billets, and although prices are a trifle irregular, $38.25 @ $38.50, delivered at mills near by, seems to be a very inside figure. In some cases higher prices are named, but sales were chiefly at the figures quoted.

Muck Bars.—There is some business doing, chiefly at prices varying from $32.50 to $33, delivered in consumers' yards. Buyers consider these figures rather high, but as yet good quality Bars have not been found available at less money, except in one special case, when 500 tons was secured at $32, delivered in consumers' yard.

Bar Iron.—Dullness is the usual report, and in some cases slightly lower figures are quoted. Consumption is large, but there was so much heavy buying during November and December that every one seems to be stocked up. The same old story of delay in specifications is heard almost daily, so that while some of the mills have plenty of work on their books, there are a good many that would be glad to secure orders for immediate delivery. The situation is therefore unsatisfactory, while the immediate outlook does not indicate any probability of important change. Prices are nominally 2¢ at mill and 2.2¢ from store, but the quotations have not been strictly adhered to during the past two or three weeks.

Skelp Iron.—There is more inquiry for Grooved Skelp, and several lots have been taken at from 1.95¢ to 2¢, delivered. Sheared is irregular at 2.15¢ @ 2.20¢, but it is said that several orders were taken at a tenth less money, and at the regular asking prices there is not much disposition to buy.

Plates.—There is some demand in prospect, and a fair average business is being done in small lots from day to day, but there is nothing important going on. Mills are pretty well supplied with orders, however, and the feeling is one of moderate confidence. Prices are a little irregular, but on the whole transactions are mostly within a small fraction of the prices recently quoted, although on offers for large lots some shading might perhaps be done. We repeat quotations as follows:

	Iron.	Steel.
Tank	2.35¢	2.75¢ @ ....
Shell	2.65¢	3.00¢ @ 3.1
Flange	3.25¢	3.25¢ @ 3.35
Fire-Box	3.75¢	3.75¢ @ 4.25
Angles	2.30¢	2.75¢ @ ....

Structural Material.—There is no change to report in this department. Mills are well supplied with orders, and while there is some disposition to shade a fraction to secure additional lines, there is a general feeling of confidence as regards the ultimate outcome. There is a considerable amount of business in prospect, and it is thought that in a few weeks' time a great deal of it will be ready for the market. Prices remain as last quoted, viz: About 2.35¢ @ 2.40¢, delivered, for Iron Bridge Plate; 2.30¢ @ 2.35¢ for Angles, with 20¢ @ 25¢ more for the same in Steel. Tees, 2.8¢ @ 2.9¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—Business is very satisfactory, considering the surroundings, and mills are employed to their fullest capacity. Several orders have been entered for shipment to Western cities, while the local demand is quite large for the season. Prices steady, and for carload lots about as follows:

Best Refined, Nos. 14 to 20	3.10¢
Best Refined, Nos. 21 to 24	3.30¢
Best Refined, Nos. 25 to 26	3.50¢
Best Refined, No. 27	3.60¢
Best Refined No. 28	3.70¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3⅛¢
Best Soft Steel, Nos. 21 to 24	3⅜¢
Best Soft Steel, Nos. 25 to 26	3⅝¢
Best Soft Steel, No. 27	4⅛¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	
Best Bloom, Galvanized, discount	60 %
Common, discount	62½ %

Old Rails.—There is very little doing in seaboard lots, although buyers could be found for desirable qualities at $27.50 @ $28 for T's. Holders of lots in store refuse to consider these figures, however, so that there is no business of any importance being done. There are bids of $28 @ $28.50, delivered in consumers' yards in the interior.

Scrap Iron.—Wrought Scrap is scarce and in good demand, but Cast Scrap and Burnt Iron are dull and hard to move. Sales during the week have been at about the following prices: No. 1 Wrought, $24.50 @ $25, Philadelphia, or for deliveries at mills in the interior $26 @ $26.50; $16.50 @ $17 for best Machinery Scrap, $15 @ $15.50 for ordinary, $16.50 @ $17 for Wrought Turnings, $11 @ $11.50 for Cast Borings, and $28 @ $30 for Old Fish-Plates.

Nails.—There is very little business at present, so that quotations are more or less nominal. Lots from store command about $2.20 for Iron and $2.40 @ $2.50 for Steel; carload lots can be had at $2 @ $2.10, but there is no disposition to buy beyond covering immediate requirements.

Wrought-Iron Pipe.—The demand is very large, some of the mills having their order-books full for several weeks to come. Discounts are quoted as follows: Butt-Welded Black, 47½ %; Butt-Welded Galvanized, 40 %; Lap-Welded Galvanized, 47½ %; Lap-Welded Black, 60 %; Boiler Tubes, 1¾ inches and smaller, 45 %; Boiler Tubes, 2 to 4 inches, 50 %; Boiler Tubes, 4½ inches and larger, 52½ %; Oil Well Casing, 52½ %.

Crane Bros. Mfg. Company, of Chicago, Ill., have leased the warehouses formerly occupied by the Reading Iron Works, Nos. 220 and 222 South Fifth street, Philadelphia, Pa., and will carry in stock a full line of goods and be prepared to quote prices and deliver promptly to jobbers and the trade generally. The stock will include Wrought-Iron Pipe, Boiler Tubes, Valves, Fittings, Tools, &c., for steam, gas and water, also Radiators for steam and hot water. Messrs. Samuel D. Hopkins and Charles E. Small have been appointed as managers, and from their long experience and extended acquaintance will doubtless command a liberal amount of trade.

Cleveland.

CLEVELAND, January 27, 1890.

Iron Ore.—There is a steady and apparently an increasing demand for non-Bessemer Ore. It is believed that 2,500,000 tons of this grade of Ore have been sold at prices ranging from $4.25 to $5, f.o.b. vessels lower lake delivery. Fully 1,000,000 tons of Bessemer Ores could have been sold during the past seven days if the mine owners had been disposed to offer the same for sale. Eastern furnacemen are making their presence in the market felt to a very considerable degree and are asking for liberal quantities of both Bessemer and non-Bessemer Ores. Following are quotations:

No. 1 Specular and Magnetic Bessemer Ores, Bessemer quality	$6.50 @ $7.25
No. 1 Specular and Magnetic Ores, Non-Bessemer quality	5.50 @ 6.25
Red Hematite Ores, Bessemer quality	@ 6.00
Red Hematite Ores, Non-Bessemer quality	4.50 @ 5.00
Menominee Range Ores, Bessemer quality	5.50 @ 6.25
Menominee Range Ores, Non-Bessemer quality	4.25 @ 5.00
Gogebic Range Ores, Bessemer quality	5.25 @ 6.25

Pig Iron.—The market is very quiet. Furnacemen are too much engrossed with existing contracts to give much attention to the future. Three or four months at the least will be required to fill all the orders placed in November and December. There is little probability of any change in quotations. The furnacemen are overwhelmed with work and have no time to discuss speculative prices. Following are quotations, f.o.b. cash at the furnace:

Nos. 1 to 6 Lake Superior Charcoal	$22.50 @ $23.50
No. 1, 2 and 3 Bessemer, ℔ ton	@ 24.50
No. 1 Strong Foundry, ℔ ton	19.80 @ 20.80
No. 2 Strong Foundry, ℔ ton	18.80 @ 19.80
No. 1 American Scotch, ℔ ton	19.30 @ 20.30
No. 2 American Scotch, ℔ ton	18.30 @ 19.30
No. 1 Soft Silvery, ℔ ton	18.50 @ 19.50
Mahoning and Shenango Valley Neutral Mill Irons, ℔ ton	18.30 @ 19.30
Mahoning and Shenango Valley Red Short Mills, ℔ ton	19.30 @ 20.30

Scrap Iron.—An effort is being made to infuse new life into the market by reducing the quotations for Old Americans to $27 @ $27.50, and at the former figures a few scattering sales are reported. Old Wheels are in slight demand.

Manufactured Iron.—Common Bar at 1.85¢ @ 1.90¢ is in great demand. Sheets are scarce and are commanding fancy prices.

Louisville.

LOUISVILLE, KY., January 27, 1890.

Pig Iron.—There has been very little trading during the past week, and the situation continues quiet but firm. Offerings continue very light, and there is no disposition on the part of holders to shade prices; on the contrary, the Southern producers are very firm and insist on prices being maintained on basis of $16 for No. 1 Foundry on cars at furnace. When this has been established as a settled fact it is thought there will be found to be many buyers from among those who have been considered as well supplied for some time to come, and that the activity which was expected after the middle of this month will be restored at no distant day. Quotations are as follows:

Southern Coke, No. 1 Foundry (new classification)	$18.75 @ $19.25
Southern Coke, No. 2 Foundry (new classification)	18.25 @ 18.75
Southern Coke, No. 3 Foundry (new classification)	17.75 @ 18.25
Gray Forge	17.25 @ 17.75
White and Mottled, different grades	15.50 @ 16.50
Silver Gray, different grades	16.25 @ 17.25
Southern Charcoal, No. 1 Foundry	18.25 @ 19.50
Southern Charcoal, No. 1 Mill	17.00 @ 17.50
Southern Car-Wheel, standard brands	23.50 @ 24.50
Southern Car-Wheel, other brands	19.25 @ 21.75
Hanging Rock Coke, No. 1 Foundry	18.50 @ 19.00
Hanging Rock Charcoal, No. 1 Foundry	22.00 @ 22.50
Hanging Rock, Cold Blast	24.00 @ 26.00

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, January 27, 1890.

Pig Iron.—The course of the market since the opening of the year has been very unsatisfactory, and while the outlook has somewhat improved during the past ten days, it is far from being what was expected. It is generally believed the next 30 days will decide which way the market will turn, and agents are governing themselves accordingly. Any improvement in the demand will greatly influence the course of the market just at this period, and on the same basis of argument, a continuation of the present dullness is almost certain to result in lower prices. Consumption is keeping up remarkably well, but as the majority of large buyers have bought sufficient to supply their needs for the next three months, it is evident that no large trade can be looked for, at the

present at least. Prices are nominally as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$19.50 @ $20.00
Southern Coke, No. 2 Foundry.	18.75 @ 19.25
Southern Coke, No. 3 Foundry,	18.25 @ 18.75
Gray Forge.....	17.75 @ 18.25
Ohio Softeners.....	20.00 @ 21.00
Lake Superior Charcoal.....	24.00 @ 24.50
Missouri.	
Charcoal Foundry, No. 1.....	22.00 @ 22.50
Charcoal Foundry, No. 2	21.00 @ 21.50
Tennessee.	
Charcoal Foundry, No. 1.....	20.00 @ 20 50
Charcoal Foundry, No. 2.....	19.25 @ 19.75

Connellsville Coke, f.o.b. East St. Louis, $5.25; St. Louis, $5.40.

Bar Iron.—The car building trade continue to be good customers to the Bar mills, and as the demand from this quarter seems in a fair way to continue mills are not at all anxious about the future. Prices are firm at about the following: Lots from mill, 2¢. Small lots from store, 2.15¢.

Barb Wire.—There is a good deal of inquiry and the prospect for a large spring trade is brighter than ever. Mills have very little surplus stock on hand and are asking full prices. For ordinary-sized lots the following prices are quoted: Painted, 3.30¢ @ 3.35¢; Galvanized, 3.90¢ @ 3.95¢; carload lots 10¢ ℔ 100 lb less than above prices.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts. CINCINNATI, January 27, 1890.

Pig Iron.—The situation, at least so far as the Southern furnaces are concerned, has changed but little during the past week. The Southern producers apparently are well fortified in their position, and have succeeded in attracting a number of small orders upon the basis laid down a few weeks ago. On the other hand, Northern furnaces have been less rigid in prices, and have been rewarded by large orders, both for present and future delivery. There has also been more movement in Iron held in second hands, the holders of such Iron accepting prices under the extreme limits demanded by producers. The shipment of Iron from furnaces upon old contracts has been quite liberal. When all things are considered, it is evident that buyers have gained some advantage from Northern stacks, if not from their Southern competitors. The general market, too, has an air of insincerity, a forced, constrained attitude and an artificial spirit. It is known that some furnaces and agents are accepting lower prices—that is, less than the basis carved out by the recent sharp and keen if not destructive competition, which led to stagnation subsequently, and it is believed that others are making or conniving duplicate transactions. Buyers have not failed to make daily inquiries, and when pressed for supplies have made purchases at holders' rates, yet those strong enough to withstand have not bought and their confidence has been emboldened by the concessions obtained by other consumers. The advices from the East concerning large contracts, at high prices for a long time, are regarded by buyers as a masquerade, and as evidence rather of weakness than of strength, and to the uninterested the forced attention called to these reports, which have the appearance of having been prepared for the occasion, leads to the same conclusion. The only sale of magnitude reported during the entire week is that of 3000 tons Lake Superior Car Wheel for delivery during the next six months. One sale of 500 tons Gray Forge, Northern brand, and one lot of 400 tons Foundry Iron are reported on basis of quotations. Other and smaller amounts of Charcoal and Coke Iron are also reported, but are scarcely worthy of attention beyond the fact of demonstrating that the market is less dull. Moderate sales of Southern Car-Wheel Iron have been made at full prices. The following are the approximate rates current here at the close, cash, f.o.b. Cincinnati, but of course it is understood that several of the largest Southern furnaces are demanding 45¢ more than outside quotations:

Foundry.	
Southern Coke, No. 1	$18.50 @ $19.00
Southern Coke, No. 2.....	18.00 @ 18.50
Southern Coke, No. 3.....	17.50 @ 18.00
Ohio Soft Stone Coal, No. 1.....	18.50 @ 19.00
Ohio Soft Stone Coal, No. 2.....	17.50 @ 18.50
Mahoning and Shenango Valley .	18.00 @ 18.50
Hanging Rock Charcoal, No. 1....	21.00 @ 23.00
Hanging Rock Charcoal, No. 2. .	20.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	19.50 @ 20 00
Tennessee and Alabama Charcoal, No. 2.	18.50 @ 19.00
Forge.	
Gray Forge..	17.00 @ 17.50
Mottled Neutral Coke	16.75 @ 17.25
Car-Wheel and Malleable Irons.	
Southern Car-Wheel.	24.00 @ 24.50
Hanging Rock, Cold Blast.	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable..	23.00 @ 25.00

Manufactured Iron.—There has been a fair degree of activity at the mills and foundries mainly due to old contracts, new orders being moderate; prices have remained steady and firm.

Nails.—There has been a fair demand and a steady firm and market. Steel Nails are given preference over Iron. Iron and Steel Nails, 12d to 40d, sell at $2.40 @ $2.50 ℔ keg, with 10¢ rebate in car lots, at mill; 50d to 60d at 25¢; 10d, 10¢; 8d and 9d, 25¢; 6d and 7d, 40¢; 4d and 5d, 60¢; 3d, $1, and 2d, $1.50 ℔ keg more; Steel Wire Nails sell at $3.10 @ $3.20 for 60d.

Old Material.—A firm tone has prevailed for Old Rails, but Old Wheels have been dull and easy. Old Wheels vary from $26.50 to $27.50, cash, as to location; Old Wheels are nominal at $19 @ 19.50, cash, here.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, January 27, 1890.

Pig Iron.—There has been little or no change during the past week. Southern furnaces will have but little Iron that they can deliver before March, and are sold largely into May and June, and some as far ahead as July to September. As a general thing the market remains very firm in tone, and no apprehension is felt but that our furnaces will realize an average of present prices during the entire year; in fact, a slight concession of 25¢ or 50¢ ℔ ton would close out nearly the entire capacity of Southern stocks for the present year. The sales that are now being made are mainly in carload and 100-ton lots, and some effort is being made to get a slight reduction in price, but so far with little or no success. Consumers who are wishing to contract for large lots have not as yet made their appearance to any great extent, although now and then there are parties heard from who would take large lots provided a small concession were made. The true solution of the immediate future of prices depends much upon the amount of nerve possessed by producers.

Detroit.

WILLIAM F. JARVIS & Co., under date of January 27, 1890, say: While the inquiries and transactions forces us to believe here that the Iron market must at least remain firm, yet we have to report that in spots it is unquestionably weak. Particularly may this be said of Bessemer. We think without doubt the weakness shown is attributable in a large measure to speculators being forced to realize. However, in certain sections full prices have been obtained for Lake Superior Charcoal, and some of the largest stocks have been reduced, as the large inquiries which we last week reported have resulted in several good-sized transactions. While we reduce our quotations to agree with the current weakness shown, we beg to say that prices are largely variable owing to the different conditions more or less affecting each particular transaction. The lowest quotations would probably apply to prompt delivery, while the highest figure must be paid for a delivery covering any number of months at all. There has been almost an absolute dearth of ordinary foundry trade during the past week. We quote the market as follows:

Lake Superior Charcoal, all numbers	$22.50 @ $23.50
Lake Superior Coke Bessemer...	23.50 @ 24.50
Katahdin (Maine Charcoal)	26.00 @ 26.50
Lake Superior Coke Foundry, all ore.....	22.00 @ 22.50
Lake Superior Coke Foundry, cinder mixed.....	20.25 @ 20.75
Standard Ohio Blackband...	21.00 @ 22.00
Southern No. 1.....	20.50 @ 21.00
Southern Gray Forge.....	19.00 @ 19.50
Jackson County (Ohio) Silvery. .	19.50 @ 20.00
Old Car-Wheels (nominal).....	21.50 @ 22.50

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, January 28, 1890.

Last week has developed a more cheerful feeling, and the outlook for the spring trade has never been better.

Pig Iron.—Brokers and furnace agents continue to report trade as being quiet, but they look for an improved demand within the next week or two; they argue that as consumers generally have been buying very sparingly of late the stocks are being reduced and will soon have to be replenished. Prices remain unchanged, with the exception of Bessemer, which is lower. There were some lots of Bessemer in second hands which owners were anxious to dispose of; these have been sold, and there is now reason to believe that the market will move steadily up again. This Iron, instead of being placed in the hands of one broker, was given to several, and, being offered by all, consumers were led to believe that there was a good deal more of it than there was. One lot of this Bessemer Iron, which was bought some months ago in the Mahoning Valley by Eastern speculators, is reported to have been sold to a Wheeling consumer at $23, delivered at Wheeling. Some Eastern Forge Iron has been on the market the past week at $17.75 at Pittsburgh, but we understand there was none of it sold; consumers generally are slow to take hold of an Iron they know but little about, and prefer to pay more for Irons which they have been using and are familiar with. We quote prices as follows:

Neutral Gray Forge.....	$18.00 @ $18.50,	cash.
All Ore Mill	19.00 @ 20.00,	"
White and Mottled	17.00 @ 17.50,	"
No. 1 Foundry.....	20.50 @ 21.00,	"
No. 2 Foundry	19.00 @ 19.50,	"
No. 1 Charcoal Foundry	24.00 @ 25.00,	"
No. 2 Charcoal Foundry	22.00 @ 23.00,	"
Cold Blast Charcoal.	25.00 @ 30.00,	"
Bessemer Iron	23.00 @ 23.50,	"

Sales of Gray Forge Iron reported at $18, $18.25 and $18.50, cash; all Ore do. at $19 cash; no sales of Bessemer reported in this market and quotations are nominal; there is not much doubt but what it could be bought at $23 50, cash, and some of the best informed think a bid of $23 would be entertained.

Muck Bar—Continues very dull, but the market is weak in consequence. We now quote at $30 @ $30.50 and $31, according to quality, delivery, &c. Those mills making Skelp Iron are the large buyers of Muck Bar in this market, and as soon as they start up full, as it is expected they will before long, there will be an increased demand for Muck. Some makers are refusing to sell the latter at

present prices, from which it is evident that they expect an advance in the near future.

Manganese.—Sales of 80 % Ferromanganese are reported all the way from $100 to $105, according to quantity, delivery, &c. A good many consumers continue to buy in small lots in anticipation of a break in the market, while others, seeing but little prospect of a break, have bought pretty freely; some of them bought freely several months ago, when prices were much lower than they are at present.

Manufactured Iron.—Some of our manufacturers report an improved demand, and nearly all the mills are pretty freely employed. The outlook for an active spring trade never was better, and our manufacturers are in good spirits. We continue to quote Bars at 1.90¢ @ 2¢; Plate Irons, 2.50¢ @ 2.60¢; No. 24 Sheet, 3.10¢; Skelp Iron, 1.90¢ @ 1.95¢ for Grooved and 2.20¢ @ 2.30¢ for Sheared, all 60 days, 2 % off for cash.

Nails.—Cut Nails remain unchanged at $2.50, 60 days, 2 % off for cash, in car lots, and Wire Nails at $2.85 @ $2.90 rates. Manufacturers here say there have been very few sales since the recent advance, and they are led to believe that some one, (whether the manufacturer or jobber) is selling below the card. It is most likely the jobber, as those having a stock bought some time ago could cut the present card and have a good margin for profit. As compared with the lowest point Nails have advanced 65¢ @ 75¢ ₱ keg. Wheeling manufacturers have been making large shipments for some time past, both West and South, a good many of which, it is thought, are being placed on former contracts. There is still a good deal of rivalry between Cut and Wire Nail makers, and it is worthy of mention that there have been two advances made on the former without any change being made in the price of the latter.

Wrought-Iron Pipe.—At the regular monthly meeting of the association in New York last week prices were advanced about 2½ %. There was no change made in the card, but discounts were reduced to the extent noted. It is very evident that the outlook for spring trade is encouraging, otherwise the advance would not have been made. Notwithstanding this is usually the dull season, the mills generally are pretty well employed. The new discounts are as follows: On Black Butt, 47½ %; on Galvanized do., 40 %; on Black Lap, 60 %; on Galvanized do., 47½ %; Boiler-Tubes, 1¼-inch and smaller, 45 %; 2 to 4 inch, 50 %; 4-inch and larger, 52½ %; Casing, 52½ % off.

Old Rails.—There have been no sales of Old Iron Rails reported here for a couple of weeks, and there appears to be little or no inquiry; the large consumers appear to be stocked; one of these, Dilworth, Porter & Co., has been stopped for some weeks past. In the absence of sales we quote nominally at $28.50 @ $29. The last sale reported three weeks ago was a lot of 1000 tons sold to a Mahoning Valley mill at $29. There is a continued demand for Old Steel Rails, and very few to be had—market West, as well as here, has been cleared. We continue to quote at $24 @ $24.50.

Structural Iron.—Demand keeps up well and continues to improve as the season advances; prices remain as quoted in last report: Angles, 2.45¢; Tees, 2.95¢; Channels, 3.10¢; Sheared Bridge Plates, 2.90¢; Universal Mill Plates, Iron, 2.55¢.

Steel Plates.—There is a continued activity and prices are firm, but unchanged: Fire-Box, 4¼¢ @ 4½¢; Flange, 3¼¢; Shell, 3¼¢; Tank, 2.90¢.

Wire Rods.—Domestic are reported easier, and we now quote at $52 @ $52.50.

Billets and Blooms.—There is a good demand, but prices are easier, in sympathy with Bessemer Pig. We now quote Bessemer Steel Billets at $36.50 @ $37. A number of sales have been made here and at Wheeling recently, to go East, at $36.50 on cars at works. The cost of transportation from both points is about the same. Carnegie, Phipps & Co. are reported to have made a sale recently of 10,000 tons to a Trenton (N. J.) firm at $36.25 on cars here. Nail Slabs may be quoted at $36.50

Merchant Steel.—There is a steady demand, with prices steady as quoted. Tool Steel, 8¢ ₱ lb and upward; Crucible Spring Steel, 4¢; Crucible Machinery, 5¢; Open-Hearth Steel, 2¾¢ @ 3¢; Bessemer Machinery Steel, 2¼¢; Tire Steel, 2¼¢.

Steel Rails—Are still quotable at $35 @ $36, cash, on cars at works, and a small sale reported at $35.25.

Railway Track Supplies.—The demand for everything in this line continues light, as it usually is at this season of the year; but an improvement is looked for before long. Prices remain unchanged. Spikes, $2.15, 30 days, on cars here, and $2.25 at Chicago and St. Louis.

Old Material—There is a steady demand and prices are steady. No. 1 Wrought Railway Shop Scrap, $23 @ $23.50, net ton; No. 1 Wrought Turnings, $16; Old Car Axles, $29 @ $30; Cast Scrap, $16.50, gross; Car-Wheels, $20.50 @ $21; Crucible Steel, $29 @ $30; Bloom and Steel Rail Ends, $25.50 @ $26.

Correction.—In special dispatch last week a sale of Bessemer Steel Billets was reported at $37.50 on cars at Wheeling to go East. It should have been at $36.50.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, January 29, 1890.

There are slight indications in some quarters that the lull in the Iron trade is drawing to a close and that buyers are again taking hold at a level slightly lower than that reached by the higher prices largely nominally made toward the close of last year.

American Pig.—The market is very quiet and is easier than it has been. The majority of sellers of Foundry Irons are adhering to prices fixed some time since, the producers of the Birmingham district notably so. Some Virginia and Northern Irons are being freely offered, and concessions can be obtained by buyers. Probably $19.50 for No. 1 would be accepted. We quote No. 1 Foundry at $19.50 @ $20.50 and No. 2 $17.75 @ $18.50. Bessemer Pig has been more freely offered, and makers have receded from the nominal quotations recently made. We note a sale of 10,000 tons by an Eastern furnace about to blow in, to an Eastern Pennsylvania Rail mill. The price is reported to have been $21.50 at furnace. There has been some figuring lately in foreign Bessemer for open-hearth furnace use. Spanish Bessemer is quoted 72/, f.o.b Bilbao, which with moderate rates of freight would figure out $27, ex-ship. It is rumored that a round block of foreign has been placed, the terms being private.

Spiegeleisen and Ferromanganese.—A lot of about 4000 tons has been sold to an Eastern Rail mill at $37.50, ex-ship, for 20 % Spiegeleisen. Ferromanganese is difficult to quote. It is very scarce. What supplies are being offered are chiefly from second hands, in small parcels. For delivery during the next two months $95 @ $97 is being quoted.

Manufactured Iron and Steel.—The market is quiet, and in some lines there is a little more pressure to sell. The structural mills are fairly busy. The bridge concerns are still taking business at figures which seem very low, considering the cost of materials. We quote Bars 1.9¢ @ 2¢ for Refined; Iron Universal Mill Plates, 2.30¢ @ 2.40¢; Angles, 2.30¢ @ 2.40¢; Tees, 2.7¢ @ 2.8¢, and Beams and Channels, 3.1¢, on dock.

Merchant Steel.—The volume of business is quite satisfactory to the mills. We quote Ordinary Hot Finish Round Shafting, 2.20¢ @ 2.30¢; small sizes do., 2.35¢ @ 2.40¢; Toe Calk, 2.50¢ @ 2.60¢, and Tire, 2.35¢ @ 2.45¢, at mill. We are informed that extras are being better adhered to than they have been for some time.

Steel Rails.—The amount of business transacted by Eastern mills during the week has been light. One mill only is now quoting $35, the others are all holding for $36, although possibly under special circumstances $35.50 might be named. The firmness of Rails, in spite of the small amount of business done for some time past, is worthy of notice. On the other hand, buyers of Rails consider present prices too high. They will not close for round lots at the figures quoted, but prefer to take their chances. Some of them avow their determination to buy only as their requirements from month to month force them. The conviction that the Rail mills can on a spurt largely increase their make gives them the feeling that such a course is entirely safe. It should not be forgotten, however, that the majority of the Rail mills are doing a large business in other kinds of Steel and that there may be some danger that they cannot get when they want it the raw material which they need.

Rail Fastenings.—The market for Angle Bars is unsettled by the offerings of a new mill, eager to book orders. A recent contract was taken on the basis of about 2¢ at mill for Iron Angles, while the makers of Steel Angle Bars ask 2.15¢; Spikes are unchanged at nominally $2.25.

Old Rails.—Business has been light, the majority of mills being well supplied for the near future. A small lot of Old Rails has been offered freely and widely at $28, Jersey City, but bids do not go over $27. Old Steel Rails are quoted $22 for short lengths.

Scrap.—There is quite a demand for Best Selected Railroad Scrap, with very little offering.

Financial.

In the general markets business is being done on a conservative basis. The single exception is cotton, which has exhibited phenomenal buoyancy since the beginning of the year, transactions being on a large scale and on advancing prices. The recent heavy exports in connection with light port receipts are construed as evidence of interior exhaustion. The values of breadstuffs have declined to a point permitting the closing out of important export orders. News came that the tax on rubber at Para had been removed. Provisions are moving out freely. Ocean freights are firm. Five shillings could be readily obtained for speedy shipments. Dry goods jobbers speak of the bright outlook for the spring season and an improved trade in woolens. A further rise in manufactured cotton will naturally follow the large advance in raw material.

The stock market was stronger and more active, reflecting easy money. The market for bonds was strong and State bonds were in demand at an advance. The strength of Reading was attributed to liberal purchases by parties identified with the Voting Trust and by those antagonistic to the present management, to strengthen their individual positions in the pending litigation. The Gould properties were well supported, with free buying. The Villard group, also St. Paul, scored an ad-

vance. On Monday the volume of business exceeded that of any previous day this year. Sugar refineries and lead trusts shared in the improvement. On Tuesday there was a halt in the upward movement. The notable exception was Louisville and Nashville, which scored an important advance on the announcement that the issue of $13,000,000 of stock authorized by the directors had all been subscribed for at 85½. Receivers were appointed for the Chesapeake and Ohio Canal, subject to the future action of the court.

Exports for the week from this port amounted to $6,243,000, and the imports were valued at $9,024,000.

Government bonds were quiet, the 4s declining ½. Quotations are as follows:

U. S. 4½s, 1891, registered	104½
U. S. 4½s, 1891, coupon	104½
U. S. 4s, 1907, registered	124
U. S. 4s, 1907, coupon	124
U. S. currency 6s, 1895	116

The Associated Banks last week gained heavily through the disbursements by the Sub-Treasury for bond purchases and the return flow of currency from the West. The exhibit shows an increase in reserve of $7,250,525, which brings the surplus up to $15,031,650 above the legal requirements, the largest amount since May 25 last. Specie and legal tenders combined increased $8,280,500 and deposits $3,719,000, while loans were contracted $3,719,900. Money has ruled much easier, banks and trust companies loaning freely at 4½ to 6 %, on call. Time money was offered in large amounts and from unexpected quarters as low as 3 % for 90 days and 4 @ 4½ % for four to six months on prime collateral. The demand for commercial paper was active and the supply good. Quotations were 5 % for 60 to 90 days' indorsed bills receivable and 5 @ 6 % for four months' acceptances.

The full official returns of the foreign commerce of the United States for December, just published, permit a survey of the statistics of exports and imports for the entire year 1889, and afford a gratifying exhibit, much better than was anticipated. December shows $100,000,000 in exports, against $63,000,000 of imports. The comparison for two years is as follows:

	1888.	1889.
Exports merchandise	$691,761,050	$827,250,373
Exports specie	64,406,852	91,623,632
Total exports, 12 months	$756,167,902	$918,874,005
Imports merchandise	$725,411,371	$770,302,657
Imports specie	26,868,742	32,218,275
Total imports, 12 months	$752,280,113	$802,520,932
Balance of trade.	$2,887,789	$116,353,073

As appears from the foregoing, the balance of trade is $116,353,073 in favor of this country, against only $3,887,789 for the year 1888, and is the best showing for many years. The Bank of England maintains the minimum rate for discounts at 6 %. This fact, together with easy money here, affected the foreign exchanges and rates were advanced to $4.84 for 60-day bills and $4.88 for demand. The stability of the European money market is by no means assured, owing to the necessities of the Argentine Republic and the uncertain future of Brazil, following closely upon an enormous expansion in speculative schemes. The refusal of the Rothschilds to negotiate a large Russian loan is regarded as significant. A failure in Buenos Ayres with about $2,400,000 liabilities in gold at the present rate of exchange directly affects no one of the New York firms in the trade. The Brazilian Minister at Washington refers with satisfaction to the fact that $100,000,000 capital for the National Bank was promptly subscribed.

The clearings of 46 cities for the week ended January 25 showed an increase of 7.9 %. New York gained 5.4; Philadelphia, 17.9; Chicago, 17.9; St. Louis, 18; New Orleans, 41.7; Baltimore, 30.9; Pittsburgh, 30.9; Cincinnati, 22; Los Angeles, 31.6, and Montreal (Can.), 8.2 %.

The output of precious metals for the year 1889 is shown by Wells, Fargo & Co.'s annual statement. Montana heads the list with a total valued at $31,500,000, and Colorado comes next with $29,250,000, the total of all the States being $123,000,000. Of this sum silver contributed 51 %, gold 26, lead 13 and copper 10. The output of gold was $32,000,000, being the largest quantity produced since 1878. Copper has had a serious drop owing to regulation of the output by the syndicate. In 1870 the yield of precious metals was little over $50,000,000, and there has been a steady increase year by year. Last year showed an increase of $14,000,000 over the year 1888. Mexico is coming to the front with both silver and gold.

Metal Market.

Copper.—The London spot quotation at the time of our last report was £48.15/, while futures stood £49.10/; this morning it is £48.15/ and £49.5/ respectively; sales in the meantime aggregated 1200 tons. The tone here has been more subdued; little or no new business has resulted and the nominal quotation for Lake is 14¼¢, Arizona 13¼¢ @ 13¾¢, and casting brands 13¢ @ 13⅛¢. The export of Pyrites from Spain the first 11 months of 1889 has been 720,625 tons, against 756,941 tons same time in 1888, and 701,841 in 1887. Of Precipitate it was respectively 31,775, 26,458 and 25,500 tons.

Tin.—Tin ruled in London a week ago £93. 15/, spot, and £94. 12/6, futures; it is cabled respectively to-day £94 and £95; sales sum up 600 tons in the interval. More inclination to do business in near futures was shown in our own market, yet the actual sales of spot and futures, up to last night, did not exceed 150 tons, at an improvement in the latter of 20¢ ℔ 100 lb, spot, and winding up to-day at 20¼¢ @ 20⅜¢. Under date December 17 Messrs. Gilfillan, Wood & Co., Singapore, express themselves to the following effect in their semi-monthly circular: "The supply does not increase to any appreciable extent, but reports from all the districts that supply this market go to prove that the arrivals will be large next month, to fall off again in February, when the Chinese New Year holidays are being felt." During the first 11 months the Straits Settlements shipped to the United States 129,138 piculs last year, against 55,027 in 1888, 65,570 in 1887, 66,873 in 1886, 37,058 in 1885, and 55,279 in 1884. At the Metal Exchange 120 tons February-March Tin were still sold at 20.85¢ @ 20.95¢.

Tin Plates.—Our dealers continue to supply the moderate demand at prices a shade below the cost of importation, presumably relying on lower prices later on to replace what they are realizing now, and from the decline in the Iron market this does not seem improbable. The total export of Tin Plates from England last year has been 430,623 tons, against 391,291 in 1888 and 353,506 in 1887. Out of the amounts named the United States received respectively 336,692, 292,623 and 268,355 tons. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, $5.50 @ $6; Coke finish, $5.20 @ $5.25; Coke Tins, Penlan grade, $4.75 @ $4.80; J. B. grade, $4.85 @ $4.90, and Wasters, $4.65.

Lead.—Some 800 tons Common Domestic were sold in the open market at 3.85¢, 3.82½¢ and 3.80¢, the feeling at the close being one of apathy and dullness at 3.80¢ bid and 3.85¢ asked, while the West has been tolerably active at 3.60¢, St. Louis, and 3.65¢, Chicago. Spanish exportation during the first 11 months has been 120,518 in 1889, against 118,737 in 1888, and 121,637 in 1887.

Spelter—Has remained inactive at 5.37½¢ @ 5.40¢. Common Domestic Silesian, having given way from £24. 7/6 to £24, in London, cannot now be quoted here any better than 7¢ @ 7⅛¢ nominally. Spain exported during the first 11 months of 1889 22,653 tons of Calamine, against 24,643 in 1888, and 21,873 in 1887.

Antimony—Is in good demand at 31¢ Cooksons's and 40½¢ Hallett's.

New York Metal Exchange.

The following sales are reported:

THURSDAY, January 23.
10 tons Tin, October.....20.65¢

FRIDAY, January 24.
10 tons Tin, February.....20.60¢

SATURDAY, January 25.
10 tons Tin, March.....20.60¢

MONDAY, January 27.
20 tons Tin, January.....20.70¢
500 tons Iron, February.....18 50¢

TUESDAY, January 28.
10 tons Tin, Spot.....20.75¢
25 tons Tin, February.....20.80¢

Coal Market.

The derangement of the Anthracite Coal trade, arising from a winter of unparalleled mildness and consequent reduced consumption, is too radical and deep-seated to be appreciably affected by any possible change of temperature during the remainder of the season. This fact is fully accepted and acted upon by Coal operators in effecting sales. Even the severely shortened production, now being enforced by the shutting down of colleries, fails to prevent a continued accumulation of Coal at shipping points. Under the circumstances, the price of Coal, excepting those sizes in demand for manufacturing purposes, is determined simply by negotiations—in other words, by the necessities of the consumer. An anomaly in the situation is the scarcity of Coal in the midst of abundance, manufacturing sizes being very active.

As remarked in a Philadelphia trade report, "The demand for Pea and Buckwheat Coal is so far in excess of the supply that orders are filled with difficulty, and prices are advancing almost daily. Pea Coal is very scarce in New York, and this size, which sold in that city two weeks ago at $2.25 ℔ ton brought $2.75 two days ago, while some fancy lots were sold as high as $3 on board. The Reading Company are moving their large accumulation of Pea Coal from Port Richmond to New York and selling it at prices that yield a profit after paying the double freight. As Pea Coal is only a waste product from the larger sizes, it can be had only when the other sizes are being mined; consequently the continuance of the stagnation in the trade in family sizes will make Pea and Buckwheat Coal even more scarce than at present." New York sales agents agree that the demand for steam purposes is the sole stay of the market. Of the 59 collieries operated by the Reading Coal and Iron Company in the Schuylkill Anthracite region 18 are absolutely closed, and the remainder are running on half time or less.

Delaware and Hudson Pea in New York is about $3.10, f.o.b., and ordinary Lehigh Pea $2.70 @ $2.75, f.o.b; Buckwheat, $2.10 @ $2.25, f.o.b.

Bituminous Coal is active and in demand at full prices. A Philadelphia correspondent says the price of Bituminous Coal is $1.10 ℔ ton at the mines, and a sharp advance is looked for unless receipts are increased. Inadequate means of transportation are a standing source of complaint in New York.

John H. Jones, Chief of Bureau of Anthracite Coal Statistics, furnishes the following statement of shipments of Anthracite Coal for the week ending January 18, 1890, compared with the same period last year:

Region.	Jan. 18, 1890. Tons.	Jan. 19, 1889. Tons.	Difference. Tons.
Wyoming.	219,486	295,685	Dec. 76,199
Lehigh....	101,034	122,837	Dec. 21,803
Schuylkill.	170,074	184,487	Dec. 14,413
Totals...	490,594	603,009	Dec. 112,415
Year to date...	1,432,400	1,648,355	Dec. 215,955

Andrew Langdon & Co., of Buffalo, Coal miners and shippers, have brought a suit in the Supreme Court, in this city, against the New York, Lake Erie and Western Railroad Company, laying their damages at $2,613,000. Among the allegations it is claimed by the plaintiffs that the Erie company, whose road affords the only communication between Buffalo and the Coal fields, discriminated against them and in favor of the Delaware and Hudson Canal Company and the Hillside Coal Company by certain concessions and drawbacks from the public freight rates, whereby the plaintiffs lost about 65¢ per ton, or $506,198.45, on the Coal handled.

The Coal trade of Norfolk, Va., is steadily growing in volume, reaching last month a total of nearly 100,000 tons. The terminal facilities of the railroads are to be largely increased. The Lehigh Valley are providing increased shipping facilities at tidewater on New York bay by extending their line through Newark.

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Mdse., cs., 15
Field, Alfred & Co., Mdse., cs., 16
Graef Cutlery Co., Cutlery, cs., 5; Hdw., cs., 21
Hartley & Graham, Mdse., cs., 5
Henderson Bros., Nails, kegs, 100
Johnson, John & Co., Mach'y, pgs. and pcs., 156
Mallory, C. H. & Co., Ironware, csc., 1
Moseman, C. M., Horse Clippers, cs., 8
Pim, Forwood & Co., Mach'y, pcs., 2
Pearson, S. & Son, Steelwork, pcs. and pgs.
Richard & Co., Mach'y, cs., 197
Sumner, Chas. P. & Co., Mach'y, cs., 26
Ward, Jas. E. & Co., Mach'y, Shovels, bdls., 50; pcs. and pgs., 189
Wiebusch & Hilger, Mdse., cs., 45
Witte, John G. & Bro., Cutlery, cs., 11
Young, E, A., Steel Shoes, 60
Order—Mach'y, pgs., 7; do., cs., 1

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, January 29, 1890.

Little change has taken place in the Pig Iron market apart from a decline in Hematites. The downward movement of prices latterly is attributed to operations of Glasgow merchants who are under engagement to complete quite extensive contracts at much lower prices than those now ruling, and therefore "bears" on the market. Consumers as well as speculators are shy and timid about buying any class of Pig Iron extensively at present prices. It is stated that there are 380,000 tons of Hematites in stock held by South Wales parties, who have formed a combination to control the market and protect themselves against alleged manipulation of the market by Glasgow speculators.

In Copper there has been a moderate business, and prices have continued to show a drooping tendency, although some purchases have been made to support the market. Deliveries continue large, and the statistical exhibits for the month, it is believed, will show a further improvement. The deliveries, however, have been largely on previous purchases, and there is a disinclination among the trade to engage in fresh business on an extensive scale at the present time. This has a rather unfavorable bearing upon the market.

Tin has ruled irregular under the weight of pressure at intervals to sell both cash lots and forwards, caused by heavy shipments from the Straits during the month. There has been a noticeable absence of demand in this market from the United States, and it is reported that no purchases for America were made direct in the primary market during the first half of the month. More activity has been shown in this market during the past 24 hours, and it is reported that 200 tons have changed hands chiefly at £95 for forward.

A Franco-English syndicate has been formed to work the Torre de Capdella Copper mines. These mines are among the best in Spain.

The Tin-Plate situation is practically the same as last week, with business moderate and buyers and sellers considerably apart in their views on prices.

Scotch Pig.—Business has been rather quiet, and all brands are offered more cheaply:

No. 1 Coltness,	f.o.b.	Glasgow	80/
No. 1 Summerlee,	"	"	78/6
No. 1 Gartsherrie,	"	"	78/6
No. 1 Langloan,	"	"	77/6
No. 1 Carnbroe,	"	"	61/
No. 1 Shotts,	"	at Leith	80/
No. 1 Glengarnock,	"	Ardrossan	78/
No. 1 Dalmellington,	"	"	70/
No. 1 Eglinton,	"	"	63/

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—The market rather dull, and prices have further receded. Makers quote No. 3 Middlesborough at 58/ for prompt.

Bessemer Pig.—Demand has slackened, and prices are rather weaker. West Coast brands, mixed numbers, now quoted at 82/, f.o.b. shipping point.

Spiegeleisen.—There is still a good demand. Sellers are very firm. English 20 % quoted 135/, f.o.b. at works.

Steel Rails.—Inquiries less numerous, but makers are very firm on prices. Heavy sections quoted at £7. 5/ and light sections £7. 12/6 @ £8, f.o.b. at N. W. England shipping point.

Steel Blooms.—A fair business doing, and prices unchanged. We quote £6. 17/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The market steady with demand fair. Bessemer, 2½ x 2½ inch, £7, f.o.b. at N. W. England shipping point.

Steel Slabs.—Prices without change and the demand moderate. Bessemer, £7, f.o.b. at N. W. England shipping point.

Old Rails.—There is a fairly active demand; holders are very firm. Tees quoted at £4. 2/6, and Double-Heads, £4. 5/ @ £4. 10/, f.o.b.

Scrap Iron.—Supply moderate and holders very firm. The demand fair. Heavy Wrought quoted £3. 10/ @ £3. 15/.

Crop Ends.—The demand fair and prices firmly held. Bessemer quoted £3. 12/6 @ £3. 15/, f.o.b.

Tin Plate.—Business has been moderate and the demand at present is light. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	17/6 @ ....
IC Bessemer Steel, Coke finish	16/6 @ 16/9
IC Siemens " " "	16/9 @ 17/
IC Coke, B. V. grade	16/ @ 16/3
Charcoal Terne, Dean grade	14/6 @ 15/

Copper.—The market quieter and prices rather lower. Chili Bars quoted at £48. 15/, spot, and £49. 5/, three months' futures. Best Selected, £56.

Manufactured Iron.—Business in this department has been smaller, but prices are firmly held. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	10	0	0	@	0	0	0
" Common "	9	0	0	@	9	5	0
Staff. Bl'k Sheet, singles	0	0	0	@	11	0	0
Welsh Bars (f.o.b. Wales)	8	7	6	@	8	12	6

Tin.—The market fairly firm and rather more active. Straits quoted at £94. 2/6, spot, and £95 for three months' futures.

Spelter.—There has been a further slight decline in prices and demand is moderate. Quoted at £24 for Ordinary Silesian.

Lead.—The market continues very quiet and is barely steady. Quoted at £13. for Soft Spanish.

MARKETS BY TELEGRAPH.

WEDNESDAY AFTERNOON.

Pittsburgh.

While business in Pig Iron continues light, there is a better feeling. A sale of Bessemer is reported delivered at Wheeling equal to about $23.65 here, but it is doubtful whether it could be sold here at over $23, as there are very few buyers at present. It is believed that about all that was in the hands of speculators has passed into the hands of consumers, and it was the speculative lots that caused the recent break in Bessemer. Muck Bar is very dull; offered at $30, cash, without finding buyers. The low price of Muck Bar is hard on Old Iron Rails, as at present prices the former is much cheaper to the consumer than the latter. Old Steel Rails are very scarce and in demand Steel Billets continue in demand at $36.50 for round lots. Wrought-Iron Pipe mills are reported very full of business for this season of the year; the more favorable weather is having a good effect.

Cincinnati.

The deadlock in prices of Southern Iron remains unbroken, but there are some indications that furnaces may relent. Buyers refuse to buy except at concessions, and have been enabled to buy Northern grades on a little lower basis than Southern Iron. Speculative holders, too, have been more inclined to meet the views of buyers, but there has been no pressure to sell even the outside lots. No large sales of any kind are reported, but small amounts are fed to needy consumers on a basis of quotations which are about 50¢ below the pegged rates of Southern stacks. The sale of 3000 tons Lake Superior Iron reported in letter was on the basis of $24, cash; 700 tons Southern Car-Wheel sold at $24.45, cash. Eastern agents are taking the temperature of the local market.

Chicago.

The situation presents many encouraging features to-day. The demand has greatly improved this week. Orders for Plates, Heavy Sheets, Nuts and other finished products have been received from all over the Northwest. From 5000 to 6000 tons Bar Iron have been sold in this territory the past week. Even Pig Iron shows more activity and inquiries are increasing. Consumers manifest much interest in the course of the market and many of them must appear as buyers in the next 30 days. It looks

as though February would be a very active month. With so much business in progress it will be strange if prices are not strengthened. Large inquiries are reported for Steel Rails, but mostly from new enterprises not yet financed. Old Material is a little stronger. Sales of Railroad Wrought Scrap have been made at $22, Iron Rails at $26 and Fish-Plates at $23.50, but not in heavy quantities. Wire Nails are active, but Cut Nails quiet, with reports of slight shading in the latter.

St. Louis.

There is no change to report in the Pig Iron situation, which, however, notwithstanding the dullness, continues to maintain a firm undertone. Under date February 1 Barb Wire will be advanced 10¢ ℔ cwt., making the price for small lots of Painted 3.45¢ and Galvanized 4.05¢. Carload lots at the usual discount of 10¢ ℔ 100 lb.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	81.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

BRAZIL.

PARA, January 24, 1890.—*India Rubber*—The provisional Government at Rio has abolished the export duty on Rubber that had been decreed in favor of the Companhia Mercantil by our provincial authorities. Here 250 tons have been taken for speculative account. The January receipts will amount to 2250 tons, against 2850 same month last year. The crop is estimated to fall short of the previous one only 1000 tons; market unsettled; exchange declining, holders refusing to name prices.—*Per cable direct.*

CHILI.

VALPARAISO, November 22, 1889.—*Copper.*—The advance in London to £48 has stimulated dealings but little, owing to the reduced stocks. Sales for the fortnight amounted to 18,118 quintals at $18.35 @ $19, equaling £46. 15/, f.o.b., per steamer. *Coal*—Remaining firmly sustained at 46/ @ 48/ afloat from Newcastle and 36/ @ 38/ Australian on the spot. *Exchange*—25¼d @ 25⅝d.—*Weber & Co*

EAST INDIES.

PENANG, December 10, 1889.—*Tin.*—Receipts reached during the fortnight 4200 piculs. Sales amounted to as much on the spot, and besides some business was done for forward delivery, Europeans being the purchasers. The market on the spot opened at $34.22½, advanced to $35.12½ and closed at $34.32.—*Schmidt, Kustermann & Co.*

COLOMBO, CEYLON, December 5, 1889.—*Plumbago.*—A moderate trade has been transacted at following quotations in rupees ℔ ton: Large Lumps, 220 @ 250; Ordinary Lumps, 200 @ 230; Chips, 150 @ 135, and Dust, 85 @ 100. Shipments since October 1 have been distributed as follows: To England, 21,602 cwt.; to Hamburg, 600; to Antwerp, 589; to Bremen, 368, and to the United States, 81,009, together 104,168, against 39,191 in 1888, 48,000 in 1887 and 38,386 in 1886. *Exchange.*—Six months' sight on London, 1/5⅝.—*Volkart Bros., Ceylon and Malabar Coast, through their agent in New York, Mr. John W. Greene, 82 Wall street*

SINGAPORE, December 17, 1889.—*Tin.*—Our last report was dated 3d inst. Since then Tin advanced to $35 ℔ picul, but closes a shade weaker at $34.87½. The supply does not increase to any appreciable extent, but reports from all districts that supply this market go to prove that the arrivals will be large next month, to fall off again in February, when the Chinese New Year holidays are being felt. *Gum Copal.*—There is still a good demand, though at slightly forward prices. Native scraped is inquired for, and contracts for forward delivery are readily made by buyers. *Gum Damar.*—There have been no arrivals to speak of. *Tonnage.*—London steam rates are a shade easier; the available quantity of room is ample for the cargo offering. For New York the Penobscot has cleared, and will be followed by another vessel, the name of which has not yet been made public. For Boston it is possible that the Antioch, to arrive, will be put on this berth. *Exchange*—Is steady at 3/2½ for six months' sight credit drafts on London. Shipments from the Straits Settlements to the United States during the first 11 months of 1889-1884 have been as follows: 129,138 piculs, as compared with 55,027 in 1888; 65,570 in 1887; 66,873 in 1886; 37,058 in 1885, and 55,279 in 1884. The steamer Rashgar took from Penang for New York 1682 piculs; the Sarpedon, 1683; the Sachsen hence, 1682; the Claymore, 3566, and the Glamorganshire, 840.—*Gilfillan, Wood & Co., through their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

SPAIN.

BILBAO, January 4, 1890.—*Iron Ore.*—Several large contracts have been made during the week; among others one for 15,000 tons Campanil at 10/7 and 25,000 Rubio Superior at 9/5. Inferior Rubio was done at 8/3 @ 8/6. The tendency is upward, the most current figures paid being 10/3 @ 11/ Campanil, and 8/5 @ 8/10 Rubios Superiores. Shipments are proceeding on a large scale, there being steamers awaiting cargoes of a joint capacity of 155,000 tons. *Pig-Iron.*—There were shipped coastwise 2271 tons and abroad 1074.—*Bilbao Maritimo y Comercial.*

BELGIUM.

BRUSSELS, January 18, 1890.—*Iron.*—Some large works in the Hainault and Charleroi basin have temporarily shut down for the want of fuel. On the 1st inst. out of 48 blast furnaces in Belgium 33 were in operation and 15 blown out. Our market remains firm at 8 to 11 francs Pig, 18 @ 20 Merchant and 19 @ 19.75 Beams, ℔ 100 kg.—*Moniteur des Interêts Materiels.*

The Proposed North River Bridge.

Gustave Lindenthal, the projector and engineer of the proposed North River Bridge between Hoboken, N. J., and Fourteenth street, New York, has published an account of the undertaking, from which we take the following data:

It will have six tracks and will be built strong enough for ten. Less than six tracks will not accommodate the business. One thousand trains and 60,000 passengers pass in and out of Jersey City every day. The plans have all been prepared. It will be the largest bridge in the world. The English Channel bridge, which is talked of, will not compare with it, for its longest span will be 1700 feet, while our span will be 2850 feet long. It is the length of the span which decides the size of a bridge, and not the length of the bridge itself, from an engineering standpoint.

It is proposed to build this bridge from Hoboken to some convenient point near Fourteenth street, New York City. This is the narrowest part of the Hudson in a length of over 50 miles, or from Peekskill to the Battery. It is cheaper to bridge the river here in a single span than with a pier in the river, because it is 200 feet down to the rock formation. The bridge span will be 2850 feet long and 150 feet above the water, 15 feet higher than the Brooklyn Bridge. There was a time when it seemed as though the physical obstacles to the construction of such a span would be insurmountable, but they do not exist today. It can be built with as much assurance of success as the Brooklyn Bridge or the Firth Bridge, now almost finished at Edinburgh. The bridge will not carry teams, because of the great cost of building the necessary approaches.

The following table shows how the proposed bridge compares with the Brooklyn Bridge.

	Brooklyn Bridge.	North River Bridge.
Length including anchorage, feet	3,700	6,500
Hight of anchorages, feet	85	210
Weight of each anchorage, tons	60,000	660,000
Length of each land span, feet	930	1,500
Length of middle span, feet	1,600	2,850
Size of towers at high-water mark feet	140 x 59	340 x 180
Hight of towers from high-water mark, feet	272	500
Hight of towers from deepest foundation to top, feet	350	600
Width of bridge, feet	85	86
Hight above high water, feet	135	156
Number of cables	4	4
Length of one cable, feet	3,580	6,100
Finished diameter of cables, inches	15½	48
Number of railroad tracks	2	6 to 10
Grade of bridge, per cent	3¼	1 5-10
Allowable speed of trains, miles an hour	10	30
Cost from anchorage to anchorage, exclusive of land damages	$5,000,000	$16,000,000

"In spite of the enormous size of our bridge," continued Mr. Lindenthal, "we can complete it in three or four years' actual working time, without deduction for bad seasons or other causes.

"While the art of bridge building is ancient the science of bridge building is modern. The longest span of a scientifically proportioned stone bridge, the Cabin John Valley Aqueduct Bridge, was built in 1870, by General Meigs, and had a span of 220 feet. The bridge over the Adda, at Trezzo, built in 1380, had a span of 251 feet, and yet it was erected before the time of mathematical mechanics. Nothing in the way of modern bridges up to 50 years ago equaled the wooden arch bridge of the Emperor Trajan, A. D. 104, over the Danube, below the rapids of the Iron Gate. At this time we can closely calculate the necessary strength of a bridge for any condition of loads, tell how much it will deflect under certain loads or temperature effects and determine its rigidity and its oscillation under defined speeds of railroad trains. The Britannia Bridge, in England, built in 1850, was the first great iron bridge. Now bridges of large size are made of steel, and although greater in size than the iron ones, they cost less. Of course we will build a suspension bridge. The East and North rivers will never be bridged in such a way as to require piers in the stream. The ribs of our suspended arch consist of steel wire cables with bracings. These bracings consist of the insertion into the cables of the stiffening trusses, which are usually independent of the cables, but which are heavy and unnecessarily weigh down the cables. By this plan of insertion the cables act as the cords and form a curved stiffening frame or suspended stiffened arch ribs. This is a matter of high economy. These stiffened cables will be 50 feet apart and will preserve their form without a change noticeable to the eye, even in the case of six processions of engines advancing on the bridge on all six tracks.

"There are only two arch ribs on our bridge, although there are six tracks. The two supporting trusses are only strained to full capacity when six trains meet, which is not a frequent occurrence. Of course a long-span bridge cannot be loaded so heavily as one of short span, but we have provided for ten double-headed freight trains running on parallel tracks—five in and five out—all meeting on the middle span, without doing the bridge a particle of harm. Long-span bridges outlast short ones because of the lessened frequency of maximum loads. This is shown by the Wheeling and Cincinnati bridges, which are as good as new, while shorter bridges near them, of greater rigidity and built after them, have had to be replaced."

A second attempt has been made by the Aluminum Bronze Company, of Bridgeport, Conn., to cast a spare propeller for the Petrel, of aluminum bronze, and Chief Engineer Towne has been sent to Bridgeport to examine the casting and test the qualities of the metal.

Freeman Wire and Iron Company, St. Louis, Mo., whose works were burned out a few days since, have made arrangements to promptly fill all orders received by them. They will begin operations toward rebuilding their plant immediately.

Hardware.

Business continues fair and in somewhat increased volume. Most of the manufacturers are well occupied with orders and some of them have sufficient on their books to keep them busy for several months. The extent to which the large trade purchased during the past few months has probably the effect of diminishing their orders at this time, and in a number of leading lines it is thought that many of the principal jobbing houses have purchased enough to carry them well through the spring trade, unless it should prove to be exceptionally heavy. In prices there is comparatively little that is new, some advances, principally in unimportant lines, having been made.

Barb Wire.

There is a somewhat improved demand in this market and prices are steady at former quotations, as follows: Carload lots, 4 cents; 3-ton lots, 4.1 cents, and small lots, 4.3 cents, with the usual deliveries.

Wire Nails.

There has been but little change in the Wire Nail market during the past week or two, quotations remaining steady at a basis of $2.90 to $3, in carload lots, at factory, smaller parcels being sold at figures more or less nearly approximating the above. The demand is fair but not especially heavy, many of the leading buyers having purchased largely at the prices which prevailed a few months ago

Cut Nails.

The New York market is fairly active and steady at $2.10 for Iron Nails, in carload lots on dock, concessions being made only in exceptional cases. The demand for Steel Nails in this section is falling off very considerably in view of the large difference in price between the Iron and Steel. There has been some talk among Eastern Nail makers to call a meeting with a view to advancing prices. It is claimed that the advance in Nails thus far does not correspond with the advance in raw material. Thus far nothing has come of this movement.

Miscellaneous Prices.

The market for Wrought Butts is somewhat stronger, the manufacturers having reached an understanding which has the effect of withdrawing the extreme quotations which have been outstanding. This agreement is not of the nature of a combination, but still is regarded as likely to give a better tone to the market.

There is some irregularity in the prices at which Chisels are offered by leading manufacturers, but the market is slightly firmer and a shade higher.

The improvement in Files, to which we referred in our last issue, still continues, and most of the makers of recognized position are naming somewhat higher prices. The demand is referred to as very satisfactory.

The manufacturers of Planes have succeeded in putting this line of goods in a very much improved condition. The prices which are now ruling are understood to yield a satisfactory profit. There also exists between the different makers such an understanding as makes it probable that prices will be maintained and possibly advanced, some measures being under consideration which if carried out will result in a strong combination or consolidation of the different interests. The existing understanding, by which the goods are sold f.o.b. at the different factories without delivery or freight allowance, has a tendency to build up business for the manufacturers in their own section, as they are thus placed at a disadvantage with regard to distant trade. Most of the factories are well filled with orders, the trade having purchased freely in anticipation of the successive advances which have taken place.

Fry Pans are regularly held at the slightly advanced quotations recently announced by the manufacturers. This line of goods is regarded as satisfactory, and it is anticipated that the market will remain in good condition.

The prices of Strap and T Hinges are regularly maintained by the manufacturers, but several of the leading jobbing houses in the principal Hardware centers are selling the goods at prices as low as those at which they can be purchased direct from the manufacturers. The stocks in jobbers' hands are understood to be quite heavy.

Some efforts have recently been made to put up the price of Wrought-Iron Goods, but they have been thus far unsuccessful. It is found difficult to secure the requisite co-operation of all the manufacturers in this line, especially in view of the fact that opposition would be encouraged by even a moderate advance in prices.

The Automatic Coin Operated Door Lock, which is put on the market by the Automatic Coin Operated Door Lock Company, 293 and 295 Broadway, New York, is sold at $10, subject to a discount of 25 and 10 per cent. A fully illustrated circular explains the construction and use of this Lock.

Wm. H. Jacobus, 90 Chambers street, New York, is agent for Fox's Combined Square and Miter, which is manufactured by Hatch & Holmes Mfg. Company, Bridgeport, Conn. The price of this tool is $12 per dozen, subject to a discount of 35 per cent.

The R. Loveland Axe Company, Lamar, Pa., who are not in the Axe combination, make the following quotations on their Axes to the retail trade:

Loveland's Excelsior, single bits	$6.75
Loveland's Jewel, all steel bits	7.50
Loveland's Excelsior, double bits	12.00
Loveland's Jewel, double bits	13.00

Another advance was made, 22d inst., in the prices of Wrought-Iron Pipe, the following being the present discounts:

Butt, Black	47½ %
" Galvanized	40 %
Lap, Black	60 %
" Galvanized	47½ %
Boiler Tubes, 1¾ inches and smaller	45 %
2 to 4 inches	50 %
4 inches and larger	52½ %
Casing	52½ %

Cleveland Block Company, Cleveland, Ohio, have issued a revised price-list, which goes into effect February 1. It is subject to the discount of 50 per cent.

The Cordage market is strong, with an upward tendency. This condition results in good part from the fact that the National Cordage Company have drawn into their association the companies which have heretofore been outside, and the organization are thus much strengthened by the accessions of manufacturers in New York, Philadelphia and Boston, and at the same time their organization is such as to control the market both in raw material and in the finished product. The company were in fact originally organized for the purpose of controlling the market in Manila and Sisal Hemp, and in connection with the success which attended their effort in this direction the scope of the organization was enlarged, rendering it practically a trust of the manufacturers of Rope, by which their product and prices are controlled. This arrangement is regarded as working very satisfactorily, the sale of large lots being made directly by the National Cordage Company and of smaller lots by the different manufacturers direct. In this condition of things it is thought probable that the present comparatively high prices will be maintained, with a good prospect of a further advance.

Sargent & Co., New York and New Haven, Conn., have issued their discount sheet No. 4 under date January 20, 1890. It relates to their catalogue of 1888. In the introductory notice they call attention to the fact that January 1 of last year they discontinued their former custom of allowing a discount for cash, so that their goods are now invoiced at net prompt cash rates. A conservative course has been pursued in announcing changes in price, and many leading lines are unaffected, some of the changes being in unimportant goods. In giving their discounts they have for the convenience of the trade indicated in heavy-face type the changes which have occurred since the issue of discount sheet No. 4. These revised discounts, which, it will be observed, cover a large variety of goods, are the following:

Page.	Dis. per cent.
242, No. 20, Narrow Fast Joint Butts	50&5
242, No. 20, Broad " "	55
243, Loose Joint Butts, No. 50.	70
244, " " No. 152	70
248, No. 456, Boston Finish Butts	85
248, No. Y456, Yeddo Bronzed Butts	75&10
248½, No. 458, Boston Finish Butts	85
248½, No. Y458, Yeddo Bronzed Butts	75&10
250, No. 875, Bronze Metal Butts	70&10
256, No. 42, Loose Pin Butts	70
256, No. 43, " "	70
257, No. 142, " "	70
257, No. 143, " "	70
257, No. 146, " "	70
258, No. 148, " "	66⅔
258, No. 149, " "	66⅔
261, No. 136, Boston Finish Butts	85
261, No. Y136, Yeddo Bronzed Butts	75&10
262, No. K442A and Y442A, Br'zed Butts	80&10
263, No. K446A and Y446A, "	80&10
264, No. Y433A Bronzed Butts	80&10
264A, No. Y431A, Yeddo Br'zed Butts	80&10
264B, No. K431A, Tokio "	80&10
265, No. K436A, " "	80&10
266, No. 836A, M836A, Br'ze Met. Butts	70&10
267, No. 834, M834, " "	75
272, Mayer's Hinges	70
272, No. 290, Parliament Butts	70
281, Ratchet Surface Spring Hinges	55
282, 283, Mortise "	55
289A, Chic Screen Door Checks	60
292, Strap and T Hinges	70&10
293, Crate Hinges	70&10
293, Hinge Hasps	70&10
293, Crate "	70&10
295, No. 160, Plate Hinges	Net
295, No. 162, Plate Hinges	Net
296, No. 88, Hook and Eye Hinges	55
296, No. 568, Hook Hinges	Net
296, No. 98, Hook Hinges	Net
297, Nos. 78, 79, Welded Hook Hinges	55
298, Rolled Blind Hinges	50
302–310, Gate Hinges	60
310, Gate Sockets	60
311, Rhoad's Gate Latches	60
312, Top "	60
312, Upright "	60
313, Gate Latches, Nos. 7, 8 and 9	60
314, Barn Door Rollers	60
314, " Hangers	60
315, New England Barn Door Hangers	60&10
315, Sterling " "	60
315, Wood Track " "	60
317, Wrought Sliding Door Rail, No. 175	60
318, Tower Bolts	60
318, Barrel "	60
325, No. 364, Neck Bolts	60
327, No. 320, "	60
330, Shutter Bolts, No. 332	60
331, "	60
338, Nos. 390, 391, Foot Bolts	66⅔
338, No. 392, "	66⅔
339, Chain Bolts, No. 380	66⅔
339, " Nos. 381, 382	66⅔
340, Extra Heavy Chain Bolts	66⅔
352–355, Flush Bolts	55
410, Chain Door Fasts	65
424, Japanned Door Handles	55
462, Flush Barn Door Pulls	60&10
490, Shelf Box Handles	65
496, 497, Clothes Line Hooks	60&10
498, 499, Harness Hooks	60
500, Store Rack Hooks	60
500, Baggage or Harness Hooks	60
503, 504, Coat and Hat Hooks, to screw	60
504, Coat and Hat Hooks, to drive	60
504A, Wire Coat and Hat Hooks	60
506, Coat and Hat Hooks, Nos. 28, 38 and 48	60
509, Coat and Hat Hooks, Nos. 22 and 122	60
513, Coat and Hat Hooks, Nos. 57 and 257	60
524, 525, Wardrobe Hooks	55

527, Ceiling Hooks, Nos. 32, 132, 33, 133.....55
543–555, Bright Wire Goods.....80&15
560, Nos. 10, 11, Picture Nails.....33⅓
582, Shutter Bars, No. 0.....60
582, " " No. T55, &c.....60&10
582, " " Nos. 107, 105.....60&10
583, Shutter Bars:
Nos. 115, 116, 117 and 114.....60&10
Nos. 67, 66, 65 and 64.....60&10
Nos. T1135A to Y1135 A. Change List of K1135A and Y1135A, 2 inch to $2.40, 2½ inch to $2.50.....60&10
588, Shutter Bars, Nos. 11 and 1.....66⅔
" " Nos. 71, 72, 73.....70
Window Springs, Nos. 19, 17.....60&10
615, Axle Pulleys.....55
616, Axle Pulleys No. 6.....50
616, " " No. 0, 00.....40
620, Ceiling Pulleys.....55
620, Hot House Pulleys.....60
621, Upright Pulleys.....60
621, Side Pulleys.....60
623, Screw Pulleys.....60
624, Incased Screw Pulleys.....60&10
625, " Swivel Pulleys.....60&10
625, Clothes L. Pulleys, No. 63 (3 in. $2.25)..60
" " " Nos. 163 (3 in. $3.25). 60
626, Clothes Line Pulleys.....55
628–630, Tackle or Awning Pulleys.....60
636–639, Foot Scrapers (List of No. 7 is $2.75).50
643, Shelf Brackets, No. 44.....60
646, Shelf Brackets, Japanned, Tuscan, Berlin.....60&10
646, Hand Rail Screws.....70
652, Wrought Staples.....80&10
653, Wrought Hooks and Staples.....80&10
654, 655, Hasps and Staples.....80&10
655, Wrought Staples on Plates.....80&10
655, Wagon Bow Staples.....80&10
658, S Hooks, &c., whole page.....80&10
659, Corner Irons.....70&10
660, Awning Hooks.....80&10
660, Sign Hooks.....80&10
661, Pipe Hooks.....80&10
661, Leader Hooks.....80&10
662–665, Meat Hooks.....80&10
666, Meat Hooks.....80&10
670, Trap Door Rings.....80&10
670, " " " and Staples.....80&10
673, Hitching Post Caps.....75&10
678, 679, Covered Spring Snaps (Change list of No. 161 to $14).....66⅔
689, Ox Balls (Change list of No. 30 to $30)...55
689, Prize Ox Balls (Bronze Metal).....55
691, Kentucky Cow Bells.....70
691, Western Cow Bells.....70
692–694, Twine Boxes.....55
707, Cork Pressers.....45
708, Garden Hooks.....66⅔
711, Shoe Hammers.....55
721, Hale Meat Cutters.....66⅔
724, Stebbins' Genuine Gates, Nos. 41 to 55. 70&10
725, Stebbins' Pattern Gates.....75
731, File Handles.....55
731, Chisel Handles.....55
733, Brad Awl Handles.....55
733, Handled Brad Awls.....55
756, Box Chisels.....60&10
757, No. 40, Carpenter's Pincers.....60
757, No. 42, " " 50
766, Nos. 5, 6, Blacksmith's Drills.....55
788–790, Store Truck Casters.....50
792, No. 847, Store Truck Casters.....50
906, Royal Sliding Door Hangers.....40
914 A B. (Make void pages 914–917.) Revised list of Tacks, &c., October 19, 1889.
Cut Tacks:
American Iron.....67½
Quarter Weight in Assorted Boxes....67½
Swedes Iron.....66⅔
Commercial Swedes Upholsterers' Tacks..70
Large Head Carpet Tacks:
American Iron, Plain and Tinned.....70
Commer'l Swedes, " " " 70
Steel Carpet Tacks.....70
Leathered Carpet Tacks.....40
Gimp and Lace Tacks.....66⅔
Looking-Glass Tacks.....50
Large Head Miners' Tacks.....70
Copper Tacks.....50
Tacks by the pound.....66⅔
Cigar Box Nails.....50
Chair Nails.....62½
Common and Patent Brads.....60
Finishing Nails (Except Copper).....65
Trunk Nails " " 66⅔
Clout Nails " " 66⅔
Shoe Nails.....Net.
Hob Nails.....Net.
Round Head Hungarian Nails.....62½
Zinc Glaziers' Points.....50
918, Japanned Lining Nails.....30&5
918, Silvered " " .....40&5
918, Japanned Saddle " 30
918, Silvered " " .....40&5
918, Iron Escutcheon Pins.....50
927, Stove Bolts.....62½
928, Common Carriage Bolts.....70&12½
928, Philadelphia Pattern Carriage Bolts....80
929, Bay State Tire Bolts.....67½
929, Norway Philadelphia Tire Bolts.....75
929, Coach Screws, Revised List of Jan 1, '90.75
930, Copper Rivets and Burrs.....55
931, Tinned Belt Rivets and Burrs.....40
931, Black and Tinned Rivets, in papers.....40
931, " " " " in bulk.....40
931, Coopers' Rivets.....40
931, Iron Rivets in bulk.....40
932, Copper Wire.....25
932, Wire Clothes Lines:

Nos.	18	19	20	45
Per dozen,	$7.00	6.00	5.00	

934, Iron Jack Chain.....75
934, Brass " " .....70&7½
934, " Safety Chain.....70&7½
936, Stocks and Dies.....33⅓&5
936, Plug and Taper Taps.....50&5
938, No. 77, Coe's Pattern Wrenches....75&10
939, Coe's Genuine Wrenches.....50&5
939, " Knife Handle Wrenches.....50&5
949, S. & Co.'s Solid Steel Hatchets.....50
953, " Grub Hoes, Mattocks, Picks.60
979, Kenewa Planes.....60
979, U. S. Extra Planes.....55
979, " Polished Planes, Beechwood.....55
" " " Applewood.....35
979, " Ship Planes.....55
979, Miscellaneous U. S. Planes.....45
980, 982, U. S. Molding Planes.....45
983, U. S. Grooving Plows.....45
989, Lufkin Rule Co.'s Board and Log Rules.50
994, 995, U. S. Augers and Bits: No. 33 Augers, 2¾ in. and larger.....50
996, Add the Copper Co.'s Augers and Bits:
Augers, 2 inch and smaller.....70&10
" 2¼ inch and larger.....60
Auger Bits, same list as No. 50.....70&10
1008, Ball Braces.....60
1008, Barbers' Braces, Nos. 10 to 15.....50
" " Nos. 21 to 23.....55
" " Nos. 71 to 73.....50
1008, Drill Braces.....25&10
1033, Add New Malleable Iron Oilers:

Nos.	21	22	23	50
Per doz.	$3.60	4.00	4.40	

1034, Blacksmiths' Bellows.....60
1037, Morton's Heel Stiffeners.....30
1052, Burnished Fry Pans.....75&5
1056, Tracing Wheels.....40
1057, Streeter's Sensible Sad Irons.....25
1063, Brass Curtain Rings.....60
1063, " Screw Rings.....60
1066, Hotchkiss' Mouse Traps.....45
1066½, Easy-Setting Choker Traps.....65
1070, Petroleum Faucets:
Haydenville Mfg. Company's.....60
Landers, Frary & Clark's.....60
1089, Giant Nail Pullers (Change list: No. 1 to $18, No. 2 to $15).....10

The last half of the pamphlet is devoted to their Door Locks, Knobs, Escutcheons, &c., of which a condensed price-list, numerically arranged, is given. This list is the same as that printed under date January 1, 1889. It is subject to a discount of 60 and 2 per cent.

Selling Goods not Carried in Stock.

Since our last issue we have received several communications on this subject, and in most of them our correspondents agree that this is a kind of business which Hardwaremen can advantageously give some attention to, and at the same time some of them give practical suggestions in regard to the best way in which it can be done. Other correspondents, however, refer to its difficulties and disadvantages, and one or two of them allude to it as a troublesome, unsatisfactory and unprofitable business. It is evident that the extent to which this kind of trade can be carried will depend very much on the circumstances of the merchant, and still more upon his make-up and his ability to obtain and use information in regard to outside goods, and the tact and facility with which he can serve his customers in this regard. Some of our correspondents who make something in the way of profit on such sales apparently realize as much if not more advantage from the reputation which they establish in the community of being well informed in business matters and able to supply anything that may be wanted. This is referred to by some of them as more than justifying the trouble of keeping posted and attending to such business, apart from any profit which may be made on goods thus sold.

On this subject we have received another communication from our Massachusetts correspondent whose trade dialogues on other subjects have entertained and instructed our readers. In his letter he states that it is found that many dollars can be saved in the course of a year by sending for outside goods, besides accommodating customers, which is alluded to as no small item in securing trade for such goods as are carried in stock:

Scene.—Country Hardware Store under more pleasant circumstances. *Dramatis personæ.*—Veracity, Keenscent, Hasty & Co., and Occasional Customer.

O. C.—Good morning, Hasty. Do you keep Magic Lanterns?

H.—We do not keep them in stock, but can get them for you.

O. C.—What will be the expense? I want a good one, not the 5-cent counter style.

H.—Ask Keenscent. He has got the "grippe" on all outside goods. Keenscent, tell this gentleman what a Magic Lantern will cost him.

K.—You can get low-cost Lanterns at the notion store across the way, I think.

O. C.—Yes, I know. I have looked them all over, but they have none that I want and are unable to tell me anything about the better grades. My boy is crazy on this Magic Lantern business and I have concluded to humor him. Now, what can you tell me about them?

K.—Here is an illustrated catalogue giving all the grades, and the prices range from $12 to $275, according to the completeness of the outfit and grade of Lantern. We can get you any Lantern you may select at 10 per cent. off this list, delivered here.

O. C.—Can you tell us how to operate then?

K.—Oh, yes! We will give you full directions with the Lantern.

O. C.—What outfit should you recommend?

K.—If your son intends to make a business of it in a small way this No. 2563 will please him. With the extras and a liberal supply of slides it will cost upward of $75, here. We can get you slides on almost any subject, and if you desire can get the apparatus for making and operating the oxy-hydrogen light, which you can attach to this Lantern for exhibitions.

O. C.—I do not think he will want to go into the exhibition business unless it be in a very small way. What will the cheaper Lanterns cost?

K.—Here is one for $12 for the Lantern only, which will give good satisfaction for home entertainment, but if he should desire to give a public exhibition it will not be as satisfactory. Read the description.

O. C.—I am of the opinion that the No. 2563 will be the best for him. You may send for that one and also the slides which I have marked on the catalogue.

K.—Very well. You may expect it about the 28th.

O. C.—What are those pamphlets you have in the binding case with the Lantern catalogue?

K.—Those are all catalogues, and in addition that row of binding cases marked from A to M are all filled with catalogues and price-lists of goods which we do not carry in stock, but order as we have calls from our customers. Each case contains from 12 to 25 catalogues, and this index tells me just where to find the description and price of any article which we have an account of. Those large cases contain catalogues of larger size, and in these pigeon-holes are very small catalogues and circulars. The circulars we place in envelopes, marking the name of the article described on the outside, so that we can

find it readily, and all these different circulars are found by the use of this same index, which refers me to the pigeon-hole containing the circular wanted.

O. C.—That explains the matter. Neighbor Jones told me that you could give information about almost anything made, and I now see how you do it. It must be a great deal of work, I should judge.

K.—Yes. It takes time, but it accommodates valued customers like yourself, and it also pays in the long run. We endeavor to keep fully posted on everything called for from Art Brass Goods and Electric Supplies to Horse and Dog Powers, Bell Punches and Pickle Testers.

O. C.—Do you order anything any one wants and take the risk of its suiting them?

K.—We take no risk. If a customer desires us to order any article we guarantee it to be just as represented, and further than that our responsibility ceases. If a stranger gives us an order for outside goods we require him to make a deposit in sufficient amount to guarantee us against loss should he fail to call for the goods.

O. C.—I believe you got those Tree Protectors for Johnson, did you not. Do you carry them in stock?

K.—No, we have not put in a stock of them. They are a new thing and we have only the sample around that post. We take hold of new and novel articles cautiously, for ten will be found unsaleable to one which supplies a "long-felt want." We endeavor to keep fully posted regarding new articles, and put them in stock as soon as the demand will warrant it, but not until then.

O. C.—I am much obliged to you for this explanation. Back here in the country I am frequently puzzled to know where to go for some odd article, and I shall call upon you again in the future. Good day, sir.

K.—Good day. Send in your neighbors when they are looking for something they do not know where to find.

As giving arguments on the other side of the question we give the following letter from a well-informed Indiana Hardwareman, in which, in addition to the views expressed as to this kind of business, practical suggestions are given in regard to the method of accommodating price-lists and trade literature so as to have the information ready for use when required. The point which is made in regard to the distribution of circulars and quotation of prices by manufacturers to consumers will also be appreciated by many of our readers, who experience no little difficulty from this source:

Your remarks a short time since on "Selling Goods not Carried in Stock" led me as an old Hardwareman, in the retail business, to think you had never retailed goods over the counter. It has always been my practice to keep a huge scrapbook, and upon receiving circulars or small paper-covered catalogues to put them in the front of my scrapbook, making discount or net prices in my cost mark. Then on some rainy day I would paste in those I thought would be useful and index them, so in a minute I could turn to any one for information desired. I have always made it a rule not to burden my mind with anything I could commit to paper, as there is no room in any one's head for rubbish, so prices and any information in regard to such goods are kept together. I am writing about my experience in a Western town, east of the Mississippi River, so my remarks will not apply to far Western or Southern places. While I have spent much time in keeping up my scrapbook, and gotten considerable satisfaction from doing so and the knowledge I gained myself, I don't ever remember of having made a cent directly from ordering any goods not kept in stock not belonging properly to the line of goods I carried. The reasons for this are as follows: A very large per cent. of people who talk about buying some kind of machine or article of large value take it out in talk. They are enthusiastic when they come in to inquire about it and the price, but when it comes to ordering there is often a lion in the way.

Some "other fellow" was talking about going in with them and had backed out, or they could not raise the money to buy it now, or their arrangements had been changed, so they did not want it. After seeing me and getting my price they had shopped around, told what I wanted for the size or number, and my competitors thought if I could afford to sell at such a price they could do a dollar better and gain this man's future trade. Thus they benefited by my labor and trouble. They reasoned that they would not have to carry it in stock, so could afford to sell it close and a little closer than I would But if the bargain was made by the customer and myself, some money paid down to insure his taking it and the article ordered, the end was not yet. When it comes it looks to him so different from the cut that he don't want it or he has not got the balance of the money to pay for it, and as I don't want to trust him, feeling sure I will never see the money and know it is not collectable by law, I make an enemy of him by holding it, until I finally send it back. But the greatest trouble is with the manufacturers themselves. They are so eager to get these goods on the market that they buy a state of names from an advertising agency and cast their bread upon the waters, knowing this is the cheapest way of reaching three or five thousand people who will be most likely to use their goods. If they do not print net price or mention discount they urge their prospective friends to write them for prices. When a granger draws on you with a Cider Mill and Press catalogue and shows you a type-written letter from the manufacturer quoting him a price within 5 per cent. of the price given you, your index scrapbook is a horrid dream and your labor naught. If he wants a Gun he can get catalogues from houses that furnish none but consumers and at but a small advance on the wholesale price. I notice each year the manufacturer is getting nearer to the consumer, avoiding the middleman and getting cash with order; or if my customer goes to the city he can have a large stock to select from and little more to pay for it than to me. The name of having bought the thing in the city themselves is worth a little extra to them. When consumers are far away from a market or merchants are carrying them on books or are satisfied with their notes these troubles I mentioned may not be existing.

In connection with this subject I want to say I have found it very unsatisfactory selling goods by cuts. While a Hardware man knows just how a thing looks from the cut, the average customer does not, and by the time the article arrives and they are not very anxious about having it the appearance or size will be made an excuse for not taking it. But if a merchant grew despondent because of all the little troubles and annoyances in business he would soon give up in disgust; so I advise merchants to keep circulars or catalogues of odd goods in a form for ready reference, as it gives one a prestige to know about everything and may lead to some money making. A thorough keeping of prices on all goods that are in stock will give you a great advantage in buying.

Other correspondents also criticise this kind of trade and allude to it as entirely unsatisfactory, but several of these, it is to be observed, do a wholesale business, and refer to their experience as being that it is undesirable for travelers to attempt to sell anything outside of their regular line. Thus a well known Ohio house refers to the matter as follows:

Our experience in taking orders for direct shipment has never been satisfactory. To confine the business to legitimate or reasonable bounds might do, but the average salesman is very apt to go too far and tries to believe that direct business can be done without profit, and the first you know he is neglecting his own stock of goods, which ought to be sold, and running up large accounts payable with very little profit. He virtually becomes traveling salesman for the manufacturer instead of his own house. We all carry too much variety. The agent with one book, as we observe it, is generally the most successful.

An enterprising New England wholesale Hardware house states the difficulties of selling goods outside of the regular line in the following terms:

To the jobber it is either profitable or unprofitable, and herein lies a solution of the subject. As far as our own experience goes we have found it unprofitable. Possibly the sale of outside goods would be satisfactory where orders could be promptly filled and a reasonable commission paid to the seller, but we believe it will result unsatisfactorily for any firm to dabble with a line of goods they know nothing about. You are never sure that you have purchased the goods at the bottom, not acquainted with the competition you may have to meet, and in many instances your customer can buy the goods lower than you have purchased them for him, thereby creating suspicion and a lack of confidence in your whole dealing with the man, and more important still, you require all your capital for the push and prosecution of your legitimate line. We pay our travelers to sell nothing but what we carry in stock.

New or Old Nail Card?

The following question is submitted by a well-known Southern house in regard to the extras on Nails:

We entered an order for 500 kegs at $2, the old card of extras being in effect, and received one-half of the Nails on this card. The company now claim that the new card is the one by which we should settle. Are they correct? No mention of extras was made at the time of entering the order.

Unsettled Condition of the Cutlery Trade.

From a well-informed representative of the Cutlery trade we have received the following trade note:

Owing to the strikes of the grinders of Scissors in Germany, manufacturers are asking more for their products and will take orders only at advanced prices. Manufacturers of Cork screws in Germany have also given their trade notice that hereafter they will advance the price 15 per cent. In England the Grinders' Union have advanced the scale of wages for grinding, and the Pocket-Knife makers have also given their employers notice that they would advance their wages scale 10 per cent. Of course on the higher grade of Pocket Knives this would not materially affect the price, and being in the minority of the class of goods brought to this country, it would further affect the market here very little. The great bulk of Pocket Knives which the American houses import are of the cheaper class, say Knives ranging from 90 cents to $1.35.

per dozen delivered here, duty paid. With such an advance on these goods as indicated it will be seen that the price is quite considerably affected. German importing houses are in an extremely unsettled condition, owing to the tariff question which has now come up in Congress. They do not know which way to move, as it seems possible that the duty on Cutlery may be increased, but the question will be undecided for some time. They would be satisfied if they could settle down on a solid basis at once and know what to figure on. If the increase in duty is made which is threatened, it will cut out all the line of Jackknives now imported, but the German manufacturers will still have a fighting chance, as will also the English manufacturers, on the finer grade of Pen Knives, which have had an established trade here.

Items.

The Rector & Wilhelmy Company, wholesale Hardware merchants, Omaha, Neb., have recently completed a very fine building, erected with a special view to its adaptation to their business. It is described as unusually convenient for receiving and handling goods. We have been promised a full description of the building in the near future.

Westphal-Hinds Hardware Company, Dubuque, Iowa, have sold their stock and good will to Schreiber & Conchar, and the jobbing Hardware business heretofore conducted by them will be continued under the style of Schreiber, Conchar & Westphal Company. This consolidation of the stock of the Westphal-Hinds Hardware Company with their own is referred to as enabling them to offer an exceptionally complete assortment, and they express the hope that by the continuance of careful attention to the wants of the trade, which has characterized both firms in the past, they may receive the generous patronage heretofore bestowed on their predecessors.

The Iron Clad Mfg. Company, No. 22 Cliff street, New York, have just ready a line of Enameled Ironware that cannot fail to attract wide attention. It has been an open secret for some time past among those best posted in the trade that this company, noted all over the world for enterprise and high quality of goods, have been preparing for the announcement which this week goes forth. That they have not been ready sooner has been due to the fact that in bringing out a new line of goods of any kind many unforeseen difficulties of both a mechanical and legal nature are to be overcome. Various obstacles have been surmounted in this case, and now the company announce that they are ready with a very complete line of Enameled Ware made under their own patents and which they are prepared to offer with unreserved and unqualified guarantees. From samples before us we can perhaps describe the Ware in a way to give the reader a fair conception of it. In general appearance and color it is not very different from the well-known Agate and Granite Ware with which it will come in direct competition. There is an absence from mottles, however, which will be at once noticed and there is a special brilliancy and gloss to the enamel. In a handsome poster or banner which the company are now sending out there is presented in large type this statement: "Absolutely free from mottles and rust spots," which indicates one idea of the merit the Ware possesses. The company inform us that they are guaranteeing these goods to be absolutely pure and durable. Their guarantee, they say, is good not only as far as indicated by the special terms used in its expression, but also as against the coating containing any deleterious materials whatsoever. In preparing this line of goods the company inform us that they have given great care to the matter of design and form of the different articles, thus securing what they believe will prove more saleable for the dealer and more acceptable to the housekeeper than anything ever before put upon the market. The company have ready a catalogue of new goods, bearing date January, 1890, which contains illustrations of this Ware, with price-list, dimensions, &c.

John Chatillon & Sons, 85, 87 and 89 Cliff street, New York, whose new price-list we noticed in our last issue, advise us that a list of smaller size is now in press and will soon be issued.

The Ehman & Simon Mfg. Company, manufacturers of Wood Mantels and Mantel Tops, have removed to their new factory, which is located on the northwest corner of Elizabeth and Fulton streets, Chicago. They now enjoy double the amount of room they had in their old quarters, and have greatly increased their facilities in the line of machinery, as well as in the convenience of their arrangements, so that work can now be turned out more promptly and the interests of their customers better served than ever before. Their large line of designs has been increased by the addition of 56 combinations, so that they now claim to have one of the most complete assortments of Wood Mantels and Mantel Tops in the country. They are further prepared to make estimates on any special work in the Mantel line from sketches or designs of architects

From the illustration given by Forehand & Wadsworth, Worcester, Mass., in their advertisement on page 69 it will be seen that they have made a change in the design of the handles or rubber stocks of their automatic Pistols. These are referred to as improving very much the appearance of the Pistols and making them more attractive and desirable. Other advantages possessed by this well-known Pistol are alluded to in the advertisement.

A. Baldwin & Co., dealers in Hardware, Machinery and Agricultural Implements, Camp and Common streets, New Orleans, are preparing to issue a catalogue of the specialties handled by them. The work has fallen into capable hands, the compiler of the catalogue being W. St. John Wolseley, who has had much experience in such matters.

Oscar G. Thomas, manufacturer of Stoves and Ranges, Taunton, Mass., issues a handsome and unique calendar in which attention is called incidentally to his manufactures.

Our readers will observe among the special notices on page 53 one signed "Canadian," who desires an engagement as salesman in the wholesale trade. This gentleman, we understand, is familiar with the Hardware business and has the best references as to ability and character. It is also stated in the announcement that he has some capital, which he would be pleased to invest in a manufacturing or mercantile business in this State or vicinity.

Announcement is made that the business of Richard Thompson, 105 Chambers street, New York, has been transferred to the Richard Thompson Company, Limited, who state that they have purchased the assets and assumed the liabilities of Richard Thompson and will continue the business as heretofore.

At the annual meeting of the Moore & Barnes Mfg. Company, Phœnix, N. Y., G. T. Moore was elected president, E. H. Hastings vice-president and R. G. Barnes secretary and treasurer. We are advised that the annual report made a satisfactory exhibit of the business of the company during the past year. The company propose to increase their capital stock to $30,000, a change which their increasing business demands.

The firm of Alderman & Yarnelle, wholesale Iron, Heavy Hardware, Wagon and Carriage Wood Stock, Fort Wayne, Ind., was dissolved by mutual consent on the 17th inst., Mr. Alderman retiring, having sold his interest in the business to W. E. Mossman. The business will be continued at the same location under the firm name of Mossman, Yarnelle & Co.

Some of the Bells manufactured by the New Departure Door Bell Company, Bristol, Conn., are illustrated in their advertisement on page 73, where an announcement is also made in regard to the patent under which these Bells are manufactured. John H. Graham & Co., 113 Chambers street, New York, are general agents for their sale.

St. Louis Screw Company, St. Louis, Mo., are putting on the market a new Hog Ring and Ringer which are alluded to as possessing valuable features.

Edward Darby & Sons, Pennsylvania Wire Works, 231 Arch street, Philadelphia, owing to the necessity of better facilities for the handling of their increasing jobbing trade in Wire and Wire Goods of every description, have taken the entire adjoining building 233 Arch street, which will be utilized in connection with the old stand as showrooms and warehouse, thus doubly increasing their present capacity

Crowell & Worthington Company, Hardware and Jewelers' Supplies, 72 Weybosset street, Providence, R. I., have issued an exceptionally neat calendar for the present year. The artistic photo-engraving which constitutes its pictorial part renders it much more attractive than many of the more showy calendars which are issued.

Surpless, Dunn & Alder, 97 Chambers street, New York, have been appointed exclusive agents for the sale of the Gates' Solid Steel Wrenches, manufactured by Lorain Wrench Company, Cleveland, Ohio. Their announcement in regard to this and other agencies appears in their advertisement on page 70.

We have received a call from F. K. Sibley, Waltham, Mass., who is in the city endeavoring to make arrangements with some one of the Emery Cloth manufacturers with a view to consolidating interests. Mr. Sibley is the inventor of Emery Cloth, and, having an experience of 35 years, during which time his Emery Cloth has attained an established reputation, desires to combine his experience with some reliable house for whom he will act as superintendent or agent. Parties desirous of securing Mr. Sibley's valuable services and experience will do well to address him upon the subject. Mr. Sibley has recently been the recipient of a unique testimonial in the form of an elegant watch and chain, presented to him by some of his leading customers. The front and the back cover are medals which have been given to him for the superiority of his Emery Cloth. The massiveness of the watch and chain is indicated in the fact that they weigh 15½ ounces and cost more than $500.

Sizes of Wire Nails.

The Wire Goods Company, Worcester, Mass., for whom the S. A. Haines Company are selling agents, 90 Chambers street, New York, issue the following circular in regard to the size and quality of Wire Nails:

A valued customer a day or two ago wanted a lot of 8d Nails and we bid $3.85 per cask. By shopping around he got a price of $3.68, delivered, and he placed

the order, thereby saving, as he said, 17 cents per cask. When the Nails came in the writer went and examined them with the customer. We found that they were made of No. 10 Wire, while the established gauge is No. 11. We also found that they contained a large percentage of bad Nails—defective from various causes—crooked heads, poor points, bent Nails, &c. We counted 1 pound and found it contained 92 Nails. The customer then opened a keg of our make of 8d Nails. We found that they were made of No. 11 Wire, which the schedule calls for, and that they had been carefully inspected. We counted 1 pound and found that it contained 121 Nails.

Throwing aside all difference in quality we found that we gave 29 more Nails to the pound than did the competitor who sold our customer. In other words a keg of our Nails would go 30 per cent. further with a carpenter than would those our customer bought. Now, if we add 30 per cent. to the price our customer paid for the fraudulent Nails, we find that they actually cost $4.79 per keg for the same Nail that we had offered to supply at $3.85. While the customer thought he had saved 17 cents he had actually lost 94 cents per cask by placing the order elsewhere. Our customer found some consolation in the fact that it would make no difference to him so long as he supplied an 8d Nail as called for and these would fill the bill, but on second thought he remarked that some of the carpentsrs had traded with him for years and had relied upon him to take care of them, and he would not be a party to such a fraud upon them as this examination had developed. Now, we mention this particular case only to call attention to every size in the list. We are frequently told that our prices are higher than some of the quotations afloat. But it is manifest that we cannot make an 8d Nail of honest size and compete in price with some one who is supplying a Nail which is branded as an 8d, but which is in fact a 10d.

Exports.

PER SHIP MOUNT CARMEL, DECEMBER 30, 1889, FOR SYDNEY, N. S. W.

By Fairbanks & Co.—432 pounds Money Drawers.

By Strong & Trowbridge.—⅓ dozen Emery-Wheels, 6 dozens Rakes, 20 dozen Axes, 19½ dozen Meat Choppers, 42 dozen Handles, 2 cases Hardware, 1 case Freezers, 2 dozen Locks, 12 gross Fasteners, 2 packages Hardware, 4 packages Pumps, 1 case Hammers, 2 cases Grindstones, 1 case Hardware, 4 dozen Hardware, 1 case Axle Washers, 1 case Tacks, 1 case Hardware, 1 box Die Plates, 1 package Die Plates, 1 case Fifth Wheels.

By Ilsley, Doubleday & Co.—1 case Wire Goods, 3 gross Hardware, 3 cases Hardware, 13 dozen Stencils, 1 case Tinware, 112 pounds Glue, 4 dozen Brushes.

By H. W. Peabody & Co.—2 packages Blocks, 21 cases Edge Tools, 10 cases Hardware, 500 yards Wire Cloth, 21 Corn Mills, 14 packages Hydraulic Presses, 1 case Iron Castings, 4 packages Stepladders, 8 packages Fishing Material, 2 cases Bolts, 15 Chucks, 27 packages Lampware, 1 case Hardware, 6 Corn Shellers, 112 pounds Nails, 1 dozen Forks, 249 dozen Handles, 19 cases Lampware, 9 packages Hardware, 1 case Copying Presses, 1 case Stamped Ware, 2 dozen Wringers, 4 cases Nails, 2 cases Bolts, 2 dozen Rakes, 1 case Broilers.

By W. H. Crossman & Bro.—8 dozen Braces, 60 dozen Handles, 10 boxes Carpenters' Tools, 20 dozen Handles, 6 dozen Lanterns, 8 cases Hardware, 1 dozen Corn Shellers, 2 dozen Churns, 112 dozen Handles, 303 pounds Iron Bolts, 1 case Plated-Ware, 16 packages Hardware, 10 dozen Glue, 1588 pounds Iron Bolts, 12 dozen Whip Sockets, 4 dozen Dashers, 24 dozen Sockets, 40 dozen Handles, 30 dozen Handles, 31 packages Stoves and parts, 3 cases Hardware, 42 packages Carriageware, 6 cases Hardware, 1900 pounds Iron Nails, 4 packages Hay Rakes, 10 Forges, 2 dozen Sprinklers, 4 cases Lamp Goods, 6 dozen Hoes, 9 dozen Forks, 22 dozen Rakes, 18 packages Hardware, 8 dozen Wrenches, 58 dozen Brushes, 3 cases Hardware.

By McLean Bros. & Rigg.—5 dozen Planes, 6 dozen Locks, 48 dozen Tacks, 41 cases Agateware, 3 dozen Cork Pullers, 6 dozen Cutlery, 2½ dozen Brushes, 40 cases Axes, 10 cases Picks, 4 Wringers, 6 dozen Hatchets, 2000 Handles, 24 dozen Handles, 36 dozen Machine Oilers, 3 packages Plated Ware, 8 dozen Braces, ¾ dozen Churns, 10 Washing Machines, 2½ dozen Churns, 10 packages Hardware, 4 cases Hardware, 12 dozen Meat Choppers, 2 dozen Hammers, 1 dozen Jacks, 15 Washing Machines, 24 dozen Handles, 135 dozen Files, 1 dozen Tills, 12 dozen Wrenches, 27 dozen Hay Forks, 6 dozen Gate Latches, 12 dozen Axle Grease, 2 dozen Braces, 4 dozen Axes, 400 pounds Nails, 6 dozen Saws, 12 dozen Washboards, 6 dozen Curry-Combs, 6 dozen Washboards, 10,000 Cartridge Shells, 5 cases Lampware.

PER BARK CARTE BLANCHE, JANUARY 13, 1890, FOR ADELAIDE, AUSTRALIA.

By Mailler & Quereau.—4538 pounds Wire, 60 dozen Axe Handles.

By McLean Bros. & Rigg.—12 Mangles, 24 Wringers, 3 dozen Wrenches, 1 dozen Screwdrivers, 12 dozen Mouse Traps, 9 dozen Plumbs and Levels, 7 dozen Wrenches, 6 dozen Hammers, 1 case Plated Ware, 900 pounds Nails, 3300 feet Wire Cloth, 2 dozen Saws, 122 pounds Whetstones, 3 Rifles, 3 Planes, 3 dozen Pulleys, 2 Washing Machines, 6 Ranges, 4 dozen Meat Choppers, 1 dozen Hoes, 3 Wringers, 1 dozen Wagon-Jacks, 6 gross Carriage Knobs, 4 dozen Saws, 1 Washing Machine, 12 dozen Lemon Squeezers.

By H. W. Peabody & Co.—488 pounds Twine, 12 Perambulators, 500 Handles, 4 cases Hardware, 3 crates Stoves, 30 dozen Handles, 6 Perambulators, 10 cases Crayons, 3 dozen Hose, 5 packages Hardware, 1 case Stove Material, 1 case Stone, 4 cases Velocipedes, 7 packages Plated Ware, 7 packages Hardware, 8 cases Lampware, 3 dozen Strops, 30 cases Hardware, 162 dozen Handles, 2 packages Lampware, 66 Perambulators, 1½ dozen Wringers, 1 case Mica, 51 cases Hardware, 5 dozen Crucibles, 4 cases Iron Castings, 5 cases Agateware.

By Meriden Britannia Company.—3 boxes Plated Ware.

By Arkell & Douglas.—8 Stoves, 7 dozen Tinware, 17,920 pounds Wire.

By H. W. Hartman.—896 pounds Nails.

By R. W. Forbes & Son.—5½ dozen Wringers, 1 box Hardware.

By Edward Miller & Co.—2 boxes Lamp Goods.

By Meriden Britannia Company.—5 packages Plated Ware and Glassware, 1 box Plated Ware.

PER BARK MARIA, JANUARY 13, 1890, FOR PORT NATAL, SOUTH AFRICA.

By H. W. Peabody & Co.—1 case Lampware, 200 Plows.

By B. S. Pray & Co.—1 case Cultivator Fittings, 3½ dozen Meat Cutters, 80 dozen Wrenches, 5 cases Hardware, 40 dozen Axes, 80 dozen Hatchets, 42 dozen Handles, 38 cases Washing Machines and Wringers, 30 dozen Hatchets, 9 dozen Picks, 1 dozen Adzes, ¼ dozen Tills, 16 dozen Handles.

By Coombs, Crosby & Eddy.—3 dozen Axes, 1 gross Polish.

PER SHIP CITY OF ATHENS, JANUARY 14, 1890, FOR MELBOURNE, AUSTRALIA.

By Sargent & Co.—45 packages Hardware.

By Bissell Carpet Sweeper Company.—21 cases Carpet Sweepers.

By Lalance & Grosjean Mfg. Company.—451 pounds Household Utensils.

By H. Disston & Sons.—916 pounds Hardware.

By Simpson, Hall, Miller & Co.—7 packages Britannia Ware.

By Edward Miller & Co.—25 packages Lamp Goods.

By J. Lloyd.—506 pounds Tools.

By Meriden Britannia Company.—4 packages Plated Ware.

By W. K. Freeman.—19 cases Hardware.

By J. A. Gifford.—18 boxes Axle Grease, 4 boxes Saddlery Hardware.

By Healy & Earl.—1 rack Lamps, 2 boxes Stove Castings, 1 case Grain Machinery, 1 Trip Hammer, 3 cases Wood-Working Machinery, 6 boxes Grain Mills.

By F. B. Wheeler & Co.—9 cases Hardware, 2 packages Hardware.

By L. Gershel & Bro.—50 Air Guns, 30,000 Cartridges.

By Welsh & Lea.—510 dozen Handles, 46 cases Axes, 4 casks Pumps, 1 case Pumps.

By R. W. Cameron & Co.—5 cases Hardware, 2 cases Tools, 26 Stoves, 3 packages Stove Parts, 3 boxes Springs.

By McLean Bros. & Rigg.—1 dozen Jacks, 40 dozen Locks, 15 dozen Hay Forks, 12 dozen Hay Rakes, 72 dozen Handles, 6 dozen Bench Screws, 20,000 Shot Cartridges, 8000 Metallic Cartridges, 2 gross Mouse Traps, 12 dozen Locks, &c.

By Mailler & Quereau.—86 dozen Axes.

By Strong & Trowbridge.—9 dozen Axes, 3 dozen Hatchets, 5⅓ dozen Hatchets and Hammers, 1 dozen Drills, 2 dozen Forks, 2 dozen Meat Choppers, 14 Emery-Wheels, 30 dozen Tacks, 100 pounds Washita Stone, 54 dozen Axes, 1 case Ice-Cream Freezers, 1 case Hardware.

By R. W. Forbes & Son.—12 packages Hardware, 36 dozen Axes, ½ dozen Hoes, 25 packages Kitchen Utensils, 12 dozen Pick Handles, 6 dozen Spade Handles, 3 dozen Meat Choppers, 14 packages Hardware, 30 gross Pencils, 15 dozen Rakes, 7 cases Hardware, 9 packages Hardware, 71 pounds Rubber, 916 pounds Carriage Bolts, 12 packages Steam Generators, 6 pages Seed Sowers.

By W. E. Peck.—19 cases Windmills, 1 case Refrigerators, 7 cases Hardware, 4 packages Plated Ware, 2 cases Fire-Arms, 8000 Cartridges, 2 packages Plated Ware, 7 packages Platedware, 4 cases Platedware.

By W. H. Crossman & Bro.—6 cases Hardware, 200 pounds Nails, 96 dozen Handles, 468 dozen Handles, 5 cases Hardware, 3 boxes Hardware, 2800 pounds Nails, 13 cases Hardware, 1 gross Handles, 2 dozen Wringers, 2 cases Hardware, 6 dozen Handles, 82 cases Hardware, 2 cases Hardware, ⅓ dozen Wringers, 5 dozen Axes, 7½ dozen Strops, 2 cases Hardware, 14 cases Hardware, 4000 pounds Nails, 200 gross Wicks, 900 pounds Nails, 15 packages Hardware, 12 dozen Bush Hooks, 200 pounds Stone, 6 Boring Machines.

PER BARK VEGA, JANUARY 18, 1890, FOR CAPE TOWN, SOUTH AFRICA.

By W. B. Fox & Bro.—2800 pounds Axle Grease.

By R. W. Forbes & Son.—¼ dozen Saws.

By M. Berliner.—82 Stoves.

By Arkell & Douglas.—5 dozen Axes, 6 dozen Fly Traps, 6 gross Axle Grease, ⅓ dozen Velocipedes.

By W. H. Peabody & Co.—10 Plows, 61 packages Carriageware.

By Strong & Trowbridge.—140 dozen Axle Grease, ⅓ dozen Scales.

By W. H. Crossman & Bro.—5 cases Hardware, 1 case Wheels, 3 packages Hardware, 4 cases and 16 bundles Carriageware, 3½ dozen Churns, 4200 pounds Nails, 5000 pounds Nails, 10 dozen Tools, 3 dozen Carriage Hardware.

By Coombs, Crosby & Eddy.—1019 pounds Jute Rope, 7½ gross Axle Grease, 12 dozen Handles, 15 dozen Hatchets, 2100 pounds Barb Wire, ⅓ dozen Stuffers, 270 pounds Washita Stone, 25 dozen Hardware, 4 dozen Mouse Traps, ⅓ dozen Meat Cutters, 1½ dozen Ladders, 2 dozen Axes, 129 pounds Carpenters' Tools, 1 gross Axle Grease, 2 dozen Traps, 3 dozen Hand Screens, 12 dozen Handles, 1 dozen Sausage Stuffers, 16 dozen Tools, ⅓ dozen Meat Cutters, 10 dozen Axes.

PER BARK ABIEL ABBOT, JANUARY 22, 1890, FOR ADELAIDE, AUSTRALIA.

By W. H. Crossman & Bro.—2240 pounds Nails, 11,206 pounds Barb Wire, 5 dozen Perambulators, 15 dozen Lanterns, 186 dozen Lamp Goods, 180 pounds Nails, 1 Chuck.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Trade has been very fair again in most lines of Paints and Colors. While not favored with anything in the way of large sized orders, manufacturers and importers state that their sales have been rather above the average for the last week of January, and jobbers, without exception, express satisfaction with their experience. In nearly all branches there is remarkable steadiness to prices so that altogether matters seem be in rather better shape than usual at this time of the year, and the opinion is general that the outlook for spring trade is flattering.

White Lead, &c.—The corroders identified with the "trust" report very good orders, both for dry Lead and Lead in oil from out of town as well as local buyers. No change whatever in prices has been made, and jobbers, it is stated, are adhering closely to the official rates. Outside manufacturers of good, bad and indifferent Lead continue to canvass actively for buy-

ers for their goods and meet with a good measure of success, but this competition does not appear to have reached proportions sufficient to prompt the "trust" and kindred concerns to resort to aggressive measures. Red Lead and Litharge are momentarily quiet, but prices are firmly held by manufacturers and jobbers alike.

Zincs.—American Oxide is moving to a very satisfactory extent, manufacturers' deliveries being free and well absorbed, while jobbers report a good distribution. Foreign Zincs are in only moderate demand but very firm at 7¼¢ for Paris Green Seal; 7⅛¢ for Paris Red Seal; 6¾¢ for Antwerp Red Seal, and 7¼¢ for Antwerp Green Seal, with the usual quantity discounts.

Colors.—House-Painters' Colors in general have been selling to a fairly good extent and the market retains a steady tone, with prices the same as quoted for some time past. Grinders' Colors are also faring remarkably well and, for the most part, at steady prices. English Vermilion is noticeably firm with indications of an advance should there be any further rise on Quicksilver. Paris Green is still in an uncertain position and showing no signs of immediate improvement.

Miscellaneous.— Chalk is without the slightest change. Whiting and Paris White are moving fairly at previous prices and Barytes remains quite firm.

Animal and Vegetable Oils.

Very little change has taken place the past week in the market for any line of oils. Transactions of other than routine character have been few and far between, and values have fluctuated within narrow limits. In point of fact, the entire market has shown remarkable steadiness throughout the week, and, while strictly of routine character, the volume of business is fully up to the average amount for the season. There is at the present time nothing indicative of any radical change in values in the immediate future. The relation of supply and demand appears to be normal, the position of the markets for raw materials and inferior greases without change and speculative interest tame.

Linseed-Oil.—Reports from the West are to the effect that prices there are relatively higher than in this market, quoting raw Oil at 60¢ in Chicago. The receipts here of out-of-town brands are light, and local manufacturers find a good outlet at full previous prices, or, say, 60¢ for domestic seed and 62¢ for Calcutta seed product.

Lard Oil.—City pressers have kept their prices steady at 53¢ for prime quality Oil, and out of town brands where up to the standard test bring about the same price. Business has been very fair in volume, although transactions of other than a jobbing character are still the exception. Raw material continues very firm in price and relatively higher than the Oil.

Cotton Seed Oils.—Crude product has remained very steady at 28¢ for prime quality, and at that price transactions have been fairly numerous. Summer Yellow is a shade firmer, with 34¢ a strictly inside price for good quality, and 35¢ generally quoted for prime. Within that range there has been a fairly active movement, in part for export.

Olive Oil.—Italian Oil in barrels has undergone a further improvement in price, the bottom figures being 85¢ for stock on the spot, and 86¢ @ 87¢ generally asked. Supplies here are moderate and in few hands. The cost in the foreign market is still higher than current local selling prices.

Sperm and Whale Oils.—There has been no movement of crude Oils in the New Bedford market and the position there is the same now as previous to the holidays. The manufactured Oils have been selling very fairly in a jobbing way in the local market at previous prices.

Menhaden Oils.—For crude product prices remain the same as quoted for some time past and the market is steady though rather dull. Pressed and bleached Menhaden and Tanners' Oils continue to be taken in jobbing quantities at previous prices.

Cocoanut Oil.—There have been quite liberal arrivals of Ceylon Oil, but the greater portion was sold previously and prices for spot stock remain quite firm. Cochin and American are unchanged.

Red Oils.—Western saponified is slow and rather weak. Elaine is lower and quoted now at 34¢. A carload of saponified was sold at 33¢ ₱ gallon.

Palm Oil.—Transactions have been less extensive this week than last, but prices are firmly held, with 5¼¢ considered a close rate for prime quality.

Danger from Outside Electric Currents.

The Boston Manufacturers' Mutual Fire Insurance Company have issued a circular entitled "Hazard from Outside Electric Currents." As this is a subject in which all are interested we reproduce the circular, as follows:

Electric light was first introduced in a very few risks insured by this company before the year 1881; in that year, and in the first six months of 1882, it was adopted in a very considerable measure. In this period of its early introduction, prior to April 1, 1882, we received notice of 23 fires which had been set by the electric current in only 61 mills which had then been equipped. No claim for loss was made on any of these fires, but they disclosed conditions which were very alarming to us. An immediate investigation was made, under the direction of Mr. C. J. H. Woodbury, and certain rules were adopted for putting up the apparatus, insulating the wires and guarding against the dangers disclosed in these 23 fires. These rules were immediately submitted to all the electric light companies or manufacturers of electric lighting apparatus who had any standing in the community, and were at once adopted by them, as well as by all insurance companies. They have not been changed since that date except so far as new inventions have called for modifications.

Since April 1, 1882, a period of nearly eight years, we have received no notice of any fire which could be attributed to electricity in any risk insured by this company, and of course no claim has been made upon us for a loss which could be attributed to this cause. Our experience, therefore, justifies the conclusion to which we came after the first two years of electric lighting, that under proper safeguards it is the safest method of lighting that can be introduced. Electricity has also been applied in some of the works insured by us as a motive-power, and electricity is now applied to lighting or motive-power in over 600 risks which are insured by the factory mutual companies.

Attention, however, has lately been called to the danger of wild currents of electricity generated on the wires which may be in use for lighting, for power and for railway service in many cities. There appears to be very little doubt that the recent destructive fire in Boston originated in the diversion of a high-tension current of electricity from its own wire to an electric-clock wire, on which it was carried to the building in which the fire originated. There appears to be little doubt that this conflagration may be attributed to the lack of precaution in guarding against an outside current of electricity. Such currents may be carried from their proper wires to other points in all cities or towns in which electric light or power is widely distributed on the public streets or over private buildings.

In order to guard against this hazard, the owners and managers of mills and works insured are advised to establish the following rules for the protection of their premises. These rules, after having been drawn by us, have been submitted to experts in various branches of electric science who are of the highest authority. The forms have been modified by them, again considered on our own part, and are believed to be suitable for what may be called an emergency:

RULES.

1. No foreign wires of any kind shall be attached to buildings insured by this company for the purpose of carrying electric currents across the yard to any point.

2. All electric wires which may be required by the insured shall enter the premises at one point near the headquarters of the night watchman, where they can be kept under supervision; each of the said wires shall be guarded by a protector against strong currents operating by opening the circuit and by a lightning arrester.

3. Such protectors against strong currents shall be located in a dry, accessible place inside the building and as near the point of entrance of wires as possible, and shall be without ground connection; such protectors shall be mounted on non-combustible and insulated supports, which shall be provided with a receptacle for the burning or melted parts of such apparatus.

4. The lightning arresters on all wires must be placed between the protector against strong currents and the electrical portion of the apparatus within the building to which such wires are connected. No ground wires for such lightning arrester shall be attached to gas-pipes within the premises of the insured.

5. All electric wires which may enter the premises of the insured must be insulated, between the line wire on the insulator attached to the buildings outside and the protecting device within, with the best quality of water-proof insulation. Moreover, such wires must enter at a distance of not less than three (3) inches from any other wire or any conducting material.

6. If any wires carrying high-tension or strong currents are to be carried over or under other wires on the property of the insured, they shall be attached to poles so near to each other, with one wire so far above the other, that if a break should occur the pendant wire between these poles may not be long enough to come in contact with the wire below, or, if not carried on poles, these wires shall be so placed or protected with guard-wires as to render a contact between different wires impossible.

7. If the high and low tension systems are in use in the same yard, even when developed within the works, the wires must be kept separate and so wide apart that no contact or cross arc can be made.

We are informed that the Bessemer Steel Company, Limited, owners of the basic patents, intend to issue licenses as soon as possible. In the meantime they are experimenting at two of the works, in order to determine what will be a fair royalty. The license will be put low in proportion to the cost to the owners of the process. The terms will be made public as soon as a fair figure has been determined upon.

The shops of the Union Bridge Company are to be removed from Buffalo and concentrated at Athens, Pa. A nine years' lease of their premises expires on April 1. The capacity of the shops at Athens will be doubled and the force of men increased from 400 to 800 or so.

Swift Double-Action Automatic Revolver.

The accompanying illustration represents a revolver which has recently been put on the market by John P. Lovell Arms Company, Boston, Mass. The most important improvement in it consists of the barrel catch, which rests firmly on the hammer when the pistol is discharged. As a result of this construction the barrel can be thrown open by pressing down on the catch, and the point is made that it is impossible for it to be opened when obstructed by the hammer, thus preventing the danger of the barrel opening when the revolver is discharged. It is claimed that an objection to their automatic shell ejecting revolvers is thus obviated. The manufacturers also call attention to the beauty and symmetry of the revolver and the excellence of the workmanship and material.

Swift Double-Action Automatic Revolver.

Bench Stop and Knife.

This article, represented in the accompanying engravings, is manufactured by Terrel & Vroom, 368 Eighth avenue, New York, for whom Harmon & Dixon, 118 Chambers street, are sole agents. It is the invention of Isaac H. Terrel, of the above firm. In Fig. 1 a view of the article is presented, Fig. 2 showing its application. It is constructed of a strip of steel with one end sharpened and turned down, thus forming a back holdfast. The two prongs are riveted on top and collared on the under side. It is obvious that no mortising, screws or nails are required to attach the stop to the bench, a light tap of a hammer placing it in position, while a light pry under the front teeth will permit its removal. The manufacturers claim that it is the only bench stop that has a back holdfast, and emphasize the rapidity with which it grips the work and holds it tight to the bench. Used as a bench knife it is easily adjusted and requires no claw-hammer to draw it from the work or bench. It can also be used to hold wide lumber straight on side of bench. The convenience and utility of this article and the low price at which it is sold are referred to by the manufacturers. Three styles are manufactured, either of which can be used as a bench stop or knife. No. 1 is beveled on the under side and is intended for light and thin work; No. 2 is beveled on top and is designed for general use; and No. 3 is beveled on top and has larger and longer prongs and is for heavy work. We are informed that this was the only bench stop awarded a medal at the recent industrial exhibition at the American Institute.

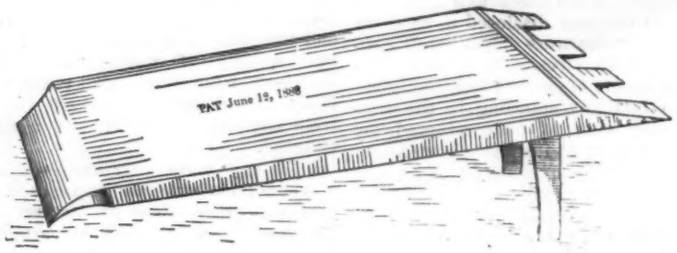


Fig. 1.—Bench Stop and Knife.

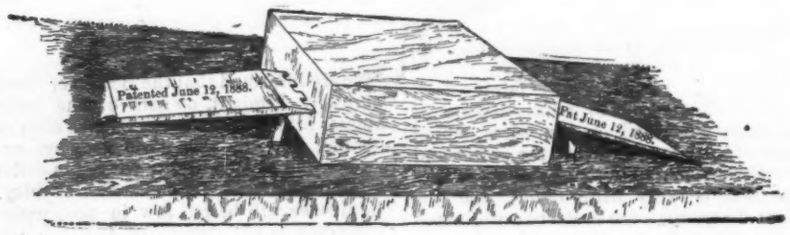


Fig. 2,—Bench Stop and Knife in Use.

The hight of ocean waves has recently been measured in a very ingenious way by floating a sensitive aneroid barometer, to which a recording apparatus was fitted, on the surface of the water. It has thus been proved that the waves attain a hight of 40 feet from trough to crest in a fairly heavy sea, and probably very much more in violent gales.

The Colby Combined Ventilator and Stove-Pipe Thimble.

The Colby Hardware and Electric Company, 35 and 37 Clark street, Chicago, have just brought out a device for ventilating kitchens and other apartments which is herewith illustrated. The operation of this device depends chiefly on the fact that the heated air of an apartment which collects near the ceiling will freely seek exit through any suitable opening communicating directly with a hot-air or smoke flue. The Colby ventilator is so constructed and connected with the flue that the current of heated air shall enter the flue at a point above the entrance of the smoke and fire gases and be deflected upward, so that it will not obstruct the upward current of the smoke. It consists of a cast-iron frame set into the brickwork and connecting with the flue in such a manner that no portion shall project into it, but be flush with the masonry. The face (which can be made as ornamental in finish as may be desired) is set flush with the plaster. The lower portion of the frame is furnished with a collar for the insertion of the stove-pipe. The upper portion, which is provided with an upwardly-directed mouth, is the ventilator proper, and the face of this portion has a flap, which is opened or closed by means of the depending rod. The face of the

Colby Ventilator and Stove-Pipe Thimble.

ventilator is formed of a single plate having a series of rectangular openings, behind which falls the mechanical device for opening and shutting off the draft of the ventilator. These ventilators are equally well adapted to be placed in any situation from ceiling to floor, wherever it may be found most desirable to locate them. A special feature of the Colby ventilator is the cam-shaped device used for holding the stove-pipe in place. The pipe cannot slip, fall or be taken out of the thimble without pressure being applied to the knob of the pipe-holder. As this ventilator does not project into the flue, it causes no obstruction to the draft of the chimney. This method of ventilating has been in use since 1886 and has proved itself entirely practicable, enabling architects to dispense in many cases with the separate flue for ventilating, so frequently found necessary. It is claimed to be a reliable means of removing excessive heat, smoke, steam, cooking odors, &c. The Colby ventilator is made in various styles and sizes, the No. 5 being the style generally used.

New Automatic Yale Rim Night-Latch.

The trade are familiar with the Yale No. 42 night-latch, which has been a standard latch for many years and has been improved in form and construction from time to time, the aim of the manufacturers being to adapt it as perfectly as possible to the requirements of the trade. Since the adoption of a corrugated key escutcheon several years ago no important change has been made in the latch, because it seemed satisfactory as giving everything that was required for security, convenience and durability. Those, however, who have attached the latches have from time to time complained that the adjustment of the lock to the door and the fitting of the cylinder in proper relation to the case was not an easy matter, especially to one who was not experienced in such work. The former construction of the lock necessitated taking off the back plate from the case, which when carelessly done sometimes allowed the working parts to fall out of the case. The company accordingly set themselves to perfect the lock and remedy this objection, and the result is the lock which is illustrated in their advertisement on page 59 and in the accompanying cuts, Figs. 1, 2 and 3, which show the method used for connecting the escutcheon to the lock case proper. This lock is referred to as so easy of adjustment that the company have designated it automatic, because it practically adjusts itself. In attaching it in place a straight hole is bored through the door, and the fitting of the latch to the door and the adjustment of the escutcheon or key cylinder to its place is exceedingly simple and indicated in the illustrations given herewith, Figs. 1, 2 and 3. It will be observed that the connecting bar, shown in Fig. 2, and the connecting screw, shown in Fig. 3, are made with grooves or notches cut in them, permitting them to be broken off so that they will be adapted to the different thicknesses of doors, and when made the proper length can be used in attaching the lock without any further adjustment. Fig. 1 shows the manner in which the lock is attached to the door, A being the back plate and BE the escutcheon and lock cylinder containing the tumbler mechanism. Referring to the illustration on this page, it will be seen that the back plate A fits into the back of the lock in such a way that its removal does not permit the lock mechanism to fall out or become disarranged. It will thus be seen that in the matter of attaching this lock to the door an important saving in time to locksmiths and others is caused, and it is anticipated that this improvement will add to the already wide favor with which this latch in its former construction was received by the trade.

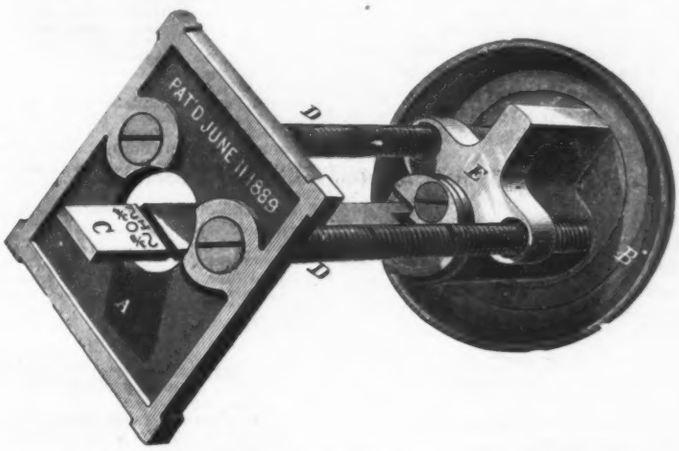
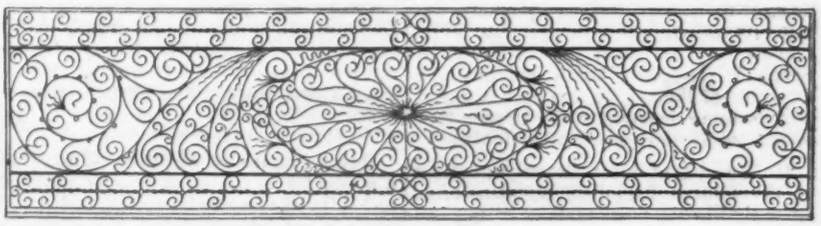


Fig. 1.—New Automatic Yale Rim Night Latch.—Manner of Connected Escutcheon.

Fig. 2.—Connecting Bar.

Fig. 3.—Connecting Screw.



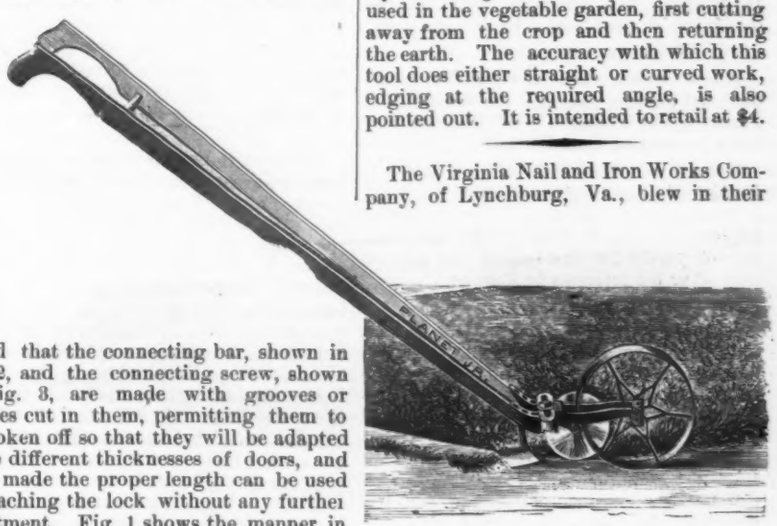
Brass Grille.

Brass Grille.

The accompanying illustration shows a polished brass grille made by Ludlow-Saylor Wire Company, St. Louis, Mo. It was designed by them and intended to be placed above the folding doors between parlors. The company are making a specialty of this class of work either from drawings supplied or from original designs of their own. The increasing demand for work of this character is evidence of the tendency toward the use of more artistic Hardware and metal manufactures.

Planet, Jr., Grass Edger.

Among the implements put on the market by S. L. Allen & Co., Philadelphia, is the grass edger illustrated in the accompanying cut, which, it will be observed, shows its construction and indicates some of the new features possessed by it. The manufacturers call attention to the fact that the operator, owing to the length of the handles, being quite a distance behind the working parts of the tool, can readily detect and rectify irregular or crooked spots in the edges. It is pointed out that the edger can be run quickly along the edges, cleaning the walk to the proper line, the sharpened wheel merely clipping the grass, while the hoe cleans the path neatly. By removing the wheel the hoe may be used in the vegetable garden, first cutting away from the crop and then returning the earth. The accuracy with which this tool does either straight or curved work, edging at the required angle, is also pointed out. It is intended to retail at $4.



The Planet, Jr., Grass Edger.

The Virginia Nail and Iron Works Company, of Lynchburg, Va., blew in their Nannie B furnace on the 24th inst., making a very satisfactory start.

PERSONAL.

After a tempestuous journey on the Servia, R. H. Johnson, who has been connected as secretary with a number of wire associations, returned from a brief business trip to England. He reports that Mr. Oakman, of the Russell Cutlery Company, has just completed the construction of a Loomis fuel gas plant for the Friths, of Sheffield, the plant being practically a duplicate of that which has been in operation for some time past at the Disston Saw Works, at Tacony, near Philadelphia.

D. B. Cobb, of South Brooklyn, builder of the famous Lighthall Condenser, is seriously ill with pneumonia.

Among the candidates proposed for membership in the American Society of Mechanical Engineers are Ensign A. A. Ackerman, U. S. N., T. C. Clark, W. W. Dashiell, W. Gregory, John H. Harris, of the Worthington Pumping Engine Company; T. A. Hilles, of Hilles & Jones Company, Wilmington; John H. Jones, of Iron Mountain, Mich.; D. G. Moore, of the Crescent Iron Works, Elizabeth; J. A. Price, the well-known stove manufacturer, of Scranton, Pa.; P. M. Sharples, of West Chester, Pa.; E. G. Spilsbury, of Cooper, Hewitt & Co., Trenton, N. J., and J. W. Tynan, of Savannah.

George H. Webb, superintendent of the Pawtucket Mfg. Company, will leave for England about May 1, for the purpose of starting up the bolt machines recently sold to the Dobcross Iron Works, near Oldham, and making the first bolts by them.

The many friends of A. R. Whitney in the iron trade will learn with pleasure that he is improving steadily and is on the road to complete recovery.

Commander William M. Folger has been appointed Chief of the Bureau of Ordnance, Navy Department.

George L. Hogan, formerly with the Scovil & Irwin Construction Company, and J. F. Falconnet, engineer on the Nashville, Chattanooga and St. Louis Railroad, have formed a copartnership as civil and mechanical engineers, and have opened offices at Nashville and Chattanooga, Tenn.

Gram Curtis, for some years chief engineer for J. P. Witherow, the well-known contractor and engineer, of Pittsburgh, has opened an office as consulting mechanical engineer, at Room 611, Lewis Block, Pittsburgh. His specialty will be the designing of steel works, rolling mills and heavy machinery.

A few weeks since N. C. Stiles, treasurer and general manager of the Stiles & Parker Press Company, of Middletown, Conn., returned from Europe.

George F. Simonds, of the Simonds Rolling Machine Company, who has been in Europe since last May, is not expected to return until May or June. He went abroad partly for his health and also to look after his interests in Europe.

Immigration for 1889.—The Bureau of Statistics reports the arrival of 426,738 immigrants from over the water during the 12 months of the year 1889. Of this number 335,553 landed at New York and entered the New World through Castle Garden. The figures show a falling off from last year, when 518,526 immigrants reached our various ports, and not less than 405,000 passed through Castle Garden. The total of immigration for 1889 is less by about 1000 than the total for 1854, 35 years ago; and of the past ten years there have been five when the figures exceeded those of the year just closed. The highest point was reached seven years ago, when the total of arrivals from Europe and Asia was 646,764 in the statistical year ending June 30, 1882. Significant changes have taken place in the character of the immigration, as indicated by the statistics of nationality. As compared with 1881, the immigration from Germany, from the Scandinavian countries and from Ireland, England and Scotland has greatly fallen off, while the immigration has greatly increased from Austria-Hungary, Russia, Poland and Italy. The quality deteriorates.

Quick Change of Engines.—Just what it means for an engine to be self-contained and shipped completely erected, tested and ready to put into operation is not always appreciated until practically illustrated. A recent occurrence at the Baldwin Locomotive Works proves this in a forcible way. The Hamilton street shop of that works has been operated for several years past (24 hours a day) by a Westinghouse 200 horse-power standard engine, which is one of a dozen or more of the same kind in use in this establishment. They have recently been replacing their larger engines with Westinghouse compounds for the purpose of gaining the greater economy due to the use of the latter. They recently had occasion to make a change from the 200 horse-power standard to a 250 horse-power compound, without stopping the works. The standard engine ran the shop up until 6 o'clock p. m., when it was stopped, disconnected, removed from the foundation; the 250 horse-power compound Westinghouse was put in its place, connected up, pipes run, and was in operation at 3.30 a. m. This is probably as quick a change as was ever made with engines of such a size. That this is only possible with a self-contained engine, which can be completely erected and tested in the shop in which it is built, is evident, and even with the advantages offered by such an engine for quick erection, it is a smart job of work to perform in such a limited time.

The Navy Department has ordered a board of officers to visit Boston some time next month to examine into the working of the system of welding by electricity, and to report upon the adaptability of the process for welding boiler flues, &c., for use on the men of war. Chains used on naval vessels are all made at the Boston Navy Yard, and it is thought that the new machine will find employment at that station, as the welding can be done much stronger by that means than by methods heretofore in use. The wire used for wrapping the experimental "wire wound guns" can be much more effectually joined by electrical welding than by any system of soldering so far tried.

The Iron Range Railroad is making extensive preparations for handling the ore tonnage of the Vermilion district of 1890. The road bed has been strengthened and the many cuts along the line have been widened, while the grades have been reduced. Large sums of money have also been and are being spent in bettering the condition of the rolling stock. Seven locomotives, 275 ore cars and five caboose cars have been purchased, making the following amount of rolling stock now in use on the entire line: 750 ore cars, 34 engines, 300 flat cars, 80 box cars and 11 passenger cars, a total of 1141 cars. Extensive improvements have been made at Two Harbors. A new yard has been built, and the ore dock's capacity increased 7000 tons, making a total capacity for handling at one time of 40,000 tons, against 33,000 for 1889 and 25,000 tons for 1888. Last year at these docks about 850,000 tons of ore were handled, while from the outlook for this year, in view of the steadiness and upward tendency of prices and firm and increasing market, it is probable that 50 per cent. more, or at least 1,250,000, will be shipped over this line. If any new mines are opened beyond Ely the line will be extended to them. A road will be built to the Mallman mine on the Mesabi.

A press dispatch from Joliet, Ill., dated January 25, says that the secretary of the Amalgamated Association of Iron and Steel Workers announce that they have settled with the management of the Illinois Steel Company, at Joliet, on the basis of 20 per cent. advance over last year's prices. The news is hailed with great delight by the business public.

The Philadelphia Testing Laboratory, Salom & Westesson, 208 South Fourth street, Philadelphia, was transferred on January 1, 1890, to Jos. Westesson, who will continue business as before, with specialties of analysis of ores, metals, &c.

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CURRENT HARDWARE PRICES.

JANUARY 29, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ₱ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.00

Cartridges.

Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting.....15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Shells—

First quality, 4, 8, 10 and 12 gauge.....25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands.....20&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.....65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&2.5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—

Standard. List.....40@40&5%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up... 68¢
U.M.C.&W. R. A.—B. E., 9&10... 82¢
U.M.C.&W. R. A.—B. E., 8..... 96¢
U.M.C.&W. R. A.—B. E., 7..... $1.10
U.M.C.&W. R. A.—P. E., 11 up.. 1.15
U.M.C.&W. R. A.—P. E., 9&10.. 1.50
U.M.C.&W. R. A.—P. E., 8..... 1.70
U.M.C.&W.R. A.—P. E., 7..... 1.80
Dis. 20&2

Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20.....2.80

Anvils.—

Eagle Anvils, ₱ ℔ 10¢.....15@15&5%
Peter Wright's.....10½¢
Armitage's Mouse Hole.....9¢
Armitage's Mouse Hole, Extra.....11½@11½¢
Trenton.....9½@10¢
Wilkinson's.....9½@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—

Advance.....₱ doz $4.75
Antrim Combination.....₱ doz 5.50
Baldwin.....₱ doz 5.25
Champion.....₱ doz 7.25
Daisy.....₱ doz 4.00
Eureka, 1888.....each 17.00
Family Bay State.....₱ doz 12.00
Favorite.....₱ doz 5.00
Gem.....₱ doz 5.25
Gold Medal.....₱ doz 4.00
Ideal.....₱ doz 4.00
Improved Bay State.....₱ doz 30.00
Little Star.....₱ doz 4.50
Monarch.....₱ doz 13.50
New Lightning.....₱ doz 5.50
Oriole.....₱ doz 4.00
Penn.....₱ doz 4.00
Perfection.....₱ doz 4.00
Pomona.....₱ doz 4.00
Rocking Table.....₱ doz 6 00
Turntable.....₱ doz 4.50
Victor.....₱ doz 13.50
Waverly.....₱ doz 4.00
White Mountain.....₱ doz 4.50
72.....₱ doz 4.25
76.....₱ doz 5.75
78.....₱ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher, [P. S. & W. Co.].
Rockford Bit Company.
} 70%

Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10&50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₱ set, 32½ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&5%
Snell's Jennings Pattern.....60%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....50&10@60%
Car Bits, P. S. & W. Co.....60&10 %
Snell's Car Bits.....60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....10%
Cincinnati Bell-Hangers' Bits.....30%

Hollow Augers—

Ives.....
French, Swift & Co.....
Douglass'.....
} 33⅓@33⅓&10%

Bonney's Adjustable, ₱ doz $48....40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25&25&10%
Cincinnati Adjustable.....30&30&5%
Cincinnati Standard.....25&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ₱ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₱ gross $2.75@3.25
Diamond.....₱ doz $1.10.....25&10%
Fee.....25&25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ₱ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood..40&10%
Cincinnati, for wood.....30&5%
Cincinnati, for metal.....40&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, .15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ₱ gr, $3.50....45&10%
Pat. Sewing, Short.$1.00 ₱ doz.....40&10%
Pat. Sewing, Long.....₱ doz $1.20
Pat. Peg, Plain Top. ₱ gr $10.00...45&10%
Pat. Peg, Leather Top. ₱ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ₱ gr $1.70, 35%
Awls, Should. Peg. ₱ gr $2.45, 40@40&10%
Awls, Pat. Peg...₱ gr 63¢....40@40&10%
Awls, Shouldered Brad...2.70 ₱ gr.....35%
Awls, Handled Brad...$7.50 ₱ gr.....45%
Awls, Handled Scratch ₱ gr, $7.50.35&10%
Awls, Socket Scratch. ₱ doz, $1.50.25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ₱ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls.. Nos. 1, $12, 2, $18.....25%
Henry's Combination Haft...₱ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—

First quality .....₱ doz $6.00@$6.50
Others.....₱ doz $5.50@$5.75

Axle Grease—

Fraser's.....Keg ₱ ℔ 4¢, Pail ₱ ℔ 5¢
Fraser's, in boxes.....₱ gr $9.50
Dixon's Everlasting, in bxs...₱ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 85¢
Lower grades, special brands, ₱ gr $5.50@$7.00

Axles—

No. 1 4¼@5¢, No. 2 5¼@6¼¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
} 3 % cash

National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengle's Pat.....₱ doz $18.....60%

Balances—

Spring Balances.....50%
Common 24-℔.....₱ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Basins, Wash—

Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beaters.

Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....25 %
See also Egg Beaters.

Bells—

Hand—

Light Brass.....70&10 @ 75%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10@35%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow,-

Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....₱ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60@60&5%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....₱ doz $9, 50%
Hotchkiss's.....₱ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....₱ doz $3.....10%
Cincinnati.....25&10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ₱ doz $15.00.....40@40&10%
Ives, ₱ doz $20.00.....60&5@60&10%
Diagonal.....₱ doz $24.00, 40%
Angular.....₱ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....₱ doz $3.00, 33⅓%
Excelsior.....₱ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Blind Fasteners—

Mackrell's, ₱ doz, $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₱ gr..60&10%
Van Sand's Old Pat., $15.00 ₱ gr...55&10%
Washburn's Old Pattern, ₱ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008, ₱ gr.....$9.00
Security Gravity, ₱ gr.....$9.00

Blind Staples—

Barbed, ¼ in. and larger.....₱ ℔ 7½@8¢
Barbed, ⅜ in.....₱ ℔ 8½@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's ..60&10%
Wr't Shutter, Brass Knob, " .....40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list...55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush, Com'n " ...55&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....70&12½&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....75&10
Bolt Ends, list Jan. 1, 1890.....75&10

Tire—

Common, list Feb. 28, '83.....67½%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....67½%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....67½%
R.B.&W., Philadel., list Oct. 16, '84....80%

Stove and Plow—

Stove.....62½%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....₱ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.
Douglass	$5.50	$6.75	50%
Snell's, Rice's Pat.	5.50	6.75	40&10&10
Jennings	5.50	6.75	45@45&10
Other Machines	2.35	2.75	net
Phillips' Patent with Augers	.00	7.50	

Bow Pins—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co.. 50&10&50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....30%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12.....65&10@70%
Osgood's Ratchet.....40&10@50%
Spofford's.....50&5@50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Common Ball, American.....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W. Co., Peck's Patent.....60%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods.....85%

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
} Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....60%&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20@5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—

Wrought Brass.....75@75&10%
Cast Brass, Tiebout's.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....55&10&5@60&5%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} .70&5@70&10%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} .70&5@70&13%

Bronzed Wrought Butts.....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier.....₱ ℔ 5½@6¢
Dewicks (Burke).....₱ ℔ 5½@6¢

Can Openers—

Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $3.00
Duplex.....dos 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4 French.....₱ doz $2.25, 55@60%
No. 5, Iron Handle.....₱ gr $6.00, 45&50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2.75&3.00
Star.....₱ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50.....50&10&10%
World's Best, ₱ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₱ doz $3.00.....35&5%
Domestic, ₱ doz $2.50.....45%
Champion ₱ doz $2.00.....50%

Cards—
Horse & Curry.....10&10@10&10&10%
Cotton.....10@10&10%
Wool.....10@10&10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen, Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $35.00

Cartridges—
See Ammunition.

Casters—
Bed, Plate } Brass....55@55&10%
Plate } Others...60@60&10%
Shallow Socket.....40&10%
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....66⅔&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Chain—
Trace, 6¼-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
Trace, 6¼-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884.....50&10@50&10&5%
American Coil, in cask lots,
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
$3.80 5.70 4.80 4.20 3.90 3.75 3.65 3.55
Less than cask lots, add ¼@½¢ ₱ ℔.
German Coil, list of June 20, 1887.....50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5@5¼¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70&5@70&10%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W., New Haven, Witherby, Mix, Ohio Tool Co. } ..75 @ 75&10 %
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $
Buck Bros.....30%
Cold Chisels, ₱ ℔.....16@19¢

Chucks—
Beach Pat.....each, $8.00....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%
Union Mfg. Co.,
Victor.....$8.50, 25%
Combination.....40%
Universal.....40%
Independent.....4 %

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....66⅔&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co. 40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises.
Carpenters', Cincinnati.....1.5%

Clips—
Norway, Axle, ½ & 5-16.....55&5&5%
2nd grade Norway Axle, ½ & 5-16 65&5&5%
Superior Axle Clips.....66⅔&5&70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Baker Axle Clips.....55%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Williamson's.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Cork Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&5&2 @ 50&10&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4½¢
Iron, Steel Points.....₱ ℔ 3¾¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓&
Wostenholme.....$7.75 to $

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10@50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.. %
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50....55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Drawing Knives—
Witherby, P. S. & W., Mix, New Haven } ..75@ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50.20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools... $1.75@$1.85
Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—
Small sizes.....₱ ℔ 6½¢
Large sizes.....₱ ℔ 5½¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ doz $1.25
Rival (Standard Co.).....₱ doz $1.00
Duplex Extra Heavy (Standard Co.)...₱ doz $3.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery—	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF FF.
Kegs, ₱ ℔	4½¢	5 ¢	2½¢
½ kegs, ₱ ℔	4½¢	5½¢	2½¢
¼ kegs, ₱ ℔	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..40%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25 &10%

Felloe Plates.....₱ ℔ 6@6½¢

Fifth Wheels.—
Derby and Cincinnati.....50&5%
Brewster.....55&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands.....60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60&10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—
Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter.₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors—.....45%

Fodder Squeezers—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—
Hay, Manure, &c., Asso List.....70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, P. D. & Co., each, $1.50. ..25%

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10&30%
Henis.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—
Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....70&10%
Acme Fry Pans.....60&10%

Fuse— ₱ 1000 ft
Common Hemp Fuse, for dry ground.$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr.. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50&50&5%
Wire, Brown & Sharpe's.....10@20%
Wire, P., S. & W. Co.....

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory.....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ⅓-in. Jute.....50&2%
Covert's, Rope, ¼-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85..25&10@35%
Buffalo Hammer Co., Humason & Beckley, Atha Tool Co. } List Jan. 15, '87 50&50&10%
Fayette R. Plumb.....40&10@50%
C. Hammond & Son, List, Oct., 1889, 50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25%
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢
3 to 5 ℔.....₱ ℔ 36¢ } 70@70&10%
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25

Handles—
Iron, Wrought or Cast—
Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.18	1.35	1.50

60&10&10%
Roggin's Latches.....₱ doz 30¢@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%
Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50 } 50% dis
Hickory Firmer Chisel, large. ₱ gr 5.00 }
Apple Firmer Chisel, ass'd... ₱ gr 5.00 }
Apple Firmer Chisel, large... ₱ gr 6.00 }
Socket Firmer Chisel, ass'd.. ₱ gr 3.00 }
Socket Framing Chisel, ass'd. ₱ gr 5.00 }
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 2.75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake Shovel, c.....60&10

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion ..... 15¢

Hangers—
Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70%
Samson Steel Anti-Friction 55%
Orleans Steel 55%
Hamilton Wrought Wood Track..... 55%
U. S. Wood Track 65%
Champion ..... 60&10%
Rider and Wooster, Medina Mfg. Co.'s list 70%
Climax Anti-Friction 60%
Climax Anti-Friction for Wood Track..55%
Zenith for Wood Track 55%
Reed's Steel Arm 50%
Challenge, Barn Door 50%
Sterling's Imp'ved (Anti-Friction)..65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00 ..... 50&2%
Cheritree ..... 50&10%
Kidder's ..... 50&10@60%
The Boss ..... 60&10%
Best Anti-Friction ..... 60&10%
Duplex (Wood Track) ..... 60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00 ..... 50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00 ..... 50&15@60%
Wood Track Iron Clad, ₱ ft. 10¢..... 50 &15@60%
Carrier Steel Anti-Friction.....50@50&5%
Architect, ₱ set $6.00 ..... 20%
Eclipse ..... 20&10%
Felix, ₱ set $4.50 ..... 20%
Richards' ..... 30@30&10%
Lane's Steel Anti-Friction 50%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat ..... 20@20&10%
Stearns' Anti-Friction ..... 20@20&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless ..... 40@40&5%
American, ₱ set $6.00 ..... 20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢ 40%
Paragon, Nos. 1, 2 and 3 ..... 40&10%
Cincinnati ..... 25&1%
Paragon, Nos. 5, 5½, 7 and 8..... 20&1%
Crescent ..... 60@60&10%
Nickel, Cast Iron 50%
Nickel, Malleable Iron and Steel 40%
Scranton Anti-Friction Single Strap..33⅓&
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction 40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00 ..... 45%
Star ..... 40&10@40&10&5%
May ..... 50&5@50&10%
Barry, $6.00 ..... 40&10%

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1886.
Isaiah Blood ..... 35@40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad 40%
Buffalo Hammer Co. ..... 40&10@50%
Hurd's ..... 40&10@50%
Fayette R. Plumb ..... 40&10@50%
Wm. Mann, Jr., & Co. ..... 50@50&5%
Underhill Edge Tool Co. ..... 40&5@40&10%
Underhill's, Haines and Bright..... 33⅓&
C. Hammond & Son ..... 40&10@50%
Simmons' ..... 40&10@50%
Peck's ..... 40&10@40&10&5%
Kelly's ..... 50@50&5%
Sargent & Co. 50%
P., S. & W. Co. 50%
Ten Eyck Edge Tool Co. 40&10@40&10&5%
Collins 10%
Schulte, Lohoff & Co. ..... 50@50&5%

Hay and Straw Knives—
Lightning, Mfrs'. price ₱ doz $18.00, 25% But jobbers cut this price freely.
Gem ..... ₱ doz $10
Wadsworth's ..... 40&7½@40&10%
Carter's Needle ..... ₱ doz $11.50@$12.00
Heath's ..... ₱ doz $13.50@14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw 40%
Nolin's Hay ..... ₱ doz $10.00

Hinges—
Wrought Iron Hinges
Strap and T ..... 70&10%
Screw Hook and Strap: 6 to 12 in., ₱ lb. 2 2-10¢; 14 to 20 in., ₱ lb. 2 7-10¢; 22 to 36 in., ₱ lb. 3 2-10¢
Heavy Welded Hook: 6 to 12 in., ₱ lb. 2 2-10¢; 14 to 20 in., ₱ lb. 2 7-10¢; 22 to 36 in., ₱ lb. 3 2-10¢
Screw Hook and Eye: ⅜ in., ₱ doz $1.50; ½ in., ₱ doz $2.45; ⅝ in., ₱ doz $3.80 — 10%
Rolled Blind Hinges, Nos. 32 and 34 ..... 50&10%
Rolled Blind Hinges, Nos. 232 and 234 ..... 55&10%
Rolled Plate ..... 70&10%
Rolled Raised ..... 70&10%
Plate Hinges "Providence": 8, 10 & 12 in., ₱ lb. 5¢; over 12 in., ₱ lb. 4¢
Spring Hinges—
Geer's Spring and Blank Butts..... 40%
Union Spring Hinge Co.'s list, March, 1886 ..... 30%
Acme 30%
J. S. ..... 25&10%
Empire and Crown 30%
Hero and Monarch 55%
American, Gem, and Star 20%
Oxford 20%
Parker's Double Acting ..... 20&10%
Union Mfg. Co. 25%
Bommer's 30%
Buckman's ..... 15@20%
Chicago 30%
Wiles' 10%
Devore's 40%
Rex 40%
Royal 60%
Reliable 60%
Champion 60%
Gate Hinges—
Western ..... ₱ doz $4.40, 60%
N. E. ..... ₱ doz $7.00, 55%
N. E. Reversible ..... ₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3 ..... 60&10&5%
N. Y. State ..... ₱ doz $5.00, 55&10%
Automatic ..... ₱ doz $12.50, 50%
Common Sense ..... ₱ doz pair $4.50, 50%
Seymour's ..... 45&10%
Shepard's ..... 60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%

Blind Hinges—
Parker ..... 75&2%
Palmer ..... 50&5&10%
Seymour ..... 70&2%
Nicholson ..... 45&10%
Huff ..... 50¢
Clark's, Nos. 1, 3, 5, 40 and 50 ..... 75&10&5@80%
Clark's Mortise Gravity 50%
Sargent's, Nos. 1, 3, 5, 11, 13 ..... 75&10@55&10&5%
Sargent's, No. 12 ..... 77&10&10%
Reading's Gravity ..... 75&10@75&10&5%
Sheard's
Noiseless ..... 75&10%
Niagara 80%
Buffalo 80%
Clark's Genuine Pattern 80%
O. S., Lull & Porter ..... 75&10%
Acme, Lull & Porter 75%
Queen City Reversible..... 75&10&5%
Clark's Lull & Porter, Nos. 0, 1, 1¼, 2, 2½, 3 ..... 75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50 ..... 25&2%

Hoes—
Handled—
Garden, Mortar, &c. 70%
Planter's, Cotton, &c. 70%
Warren Hoe 50%
Magic ..... ₱ doz $4.00
Eye—
D. & H. Scovil 20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern..30%
Maynard, S. & O. Pat. ..... 45&5%
Sandusky Tool Co., S. & O. Pat. 60&5@60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub ..... 60@60&10%

Hog Rings and Ringers—
Hill's Improved Ringers. . . ₱ doz $4.25
Hill's Old Style Ringers..... ₱ doz $2.75
Hill's Tongs. ₱ doz $4.50
Hill's Rings. ₱ doz bxs $2.15@2.25
Perfect Rings. ₱ doz bxs $1.60@1.70
Perfect Ringers..... ₱ doz $2.15@$2.25
Blair's Hog Ringers..... ₱ doz $2.25@2.50
Blair's Hog Rings..... ₱ doz 90¢@$1.00
Champion Ringers..... ₱ doz $2.00
Champion Rings, Double..... ₱ doz $2.25
Brown's Ringers..... ₱ doz $2.00
Brown's Rings..... ₱ doz $1.25@1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake 20%
Moore's Differential Pulley Block... .40%
Energy Mfg. Co's..... 25%

Holders, File and Tool—
Bals Pat ..... ₱ doz $4.00; 25%
Nicholson File Holders..... 20%

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground ..... 55&5@60&5%
Unground ..... 55&10@60&10&5%
White Enameled-Ware—
Maslin Kettles ..... 60&10&10%
Boilers and Saucepans..... 40&5%
Tinned Boilers and Saucepans..... 40&5%
Gray Enameled-Ware—
Stove 50%
Maslin Kettles..... 60&10&10%
Boilers and Saucepans..... 40&5%
Agate and Granite Ware, list Jan. 1, 1889 ..... 33⅓&10%
Ironclad Enameled Ware ..dis 33⅓&10%
Rustless Hollow-Ware..... 50&50&5%
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton ..... 40&5%
Meriden Britannia Co. ..... 40&5%
Simpson, Hall, Miller & Co. ..... 40&5%
Rogers & Brother ..... 40&5%
Hartford Silver Plate Co. ..... 40&5&5%
William Rogers Mfg. Co. ..... 40&5&5%

Hooks—
Cast Iron—
Bird Cage, Sargent's list..... 60&10&10%
Bird Cage, Reading..... 60&10&10%
Clothes Line, Sargent's list.. 60&10&10%
Clothes Line, Reading list. 60&10&10%
Ceiling, Sargent's list..... 55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading .50&10@50&10&10%
Wrought Iron—
Cotton ..... ₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886 ..... 50%
Wire Coat and Hat, Miles', list April, 1886 ..... 50%
Indestructible Coat and Hat..... 45%
Wire Coat and Hat, Standard..... 45%
Belt ..... 80@80&10%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass ..... ₱ doz $2.25
Bush ..... 55&60%
Whiffletree—Patent 55%
Hooks and Eyes—Malleable Iron. 70&70&10%
Hooks and Eyes—Brass..... 60&10&10%
Fish Hooks, American 50%
Bench Hooks ..... See Bench Stops.

Horse Nails—

Nos.	6	7	8	9	10
Ausable	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.. ..... 10½ @ 11¢, net
Essex ....28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Lyra ....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Snowden ....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Putnam.....23¢ 21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 10%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢. 25@25&5%
Globe .....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
A. C. .....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
C. B.-K. .....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢. 25&10&10%
New Haven..28 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢..30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell....28¢ 26¢ 5¢ 24¢ 23¢. 35&5@35&10%
Star .....23¢ 21¢ ve 19¢ 18¢. 10&10@10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢ 35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢..40&10%
Empire Bronzed. ..... 14 ₱ lb.

Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition..... ...75&10@75&10&5%
Standard..... ..70@70&10%
Extra..... 6C@60&10%
N. Y. B. & P. Co., Para..... 30&10%
N. Y. B. & P. Co., Extra..... 50%
N. Y. B. & P. Co., Dundee.....60&10&5%

Huskers—
Blair's Adjustable..... ₱ gr $8.00
Blair's Adjustable Clipper... .. ₱ gr 7.00
Hubbard's Solid Steel..... ₱ gr 4.50

Indurated Fiber-Ware—25%.
Spittoons, No. 2, ₱ doz..... $9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3..... $3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest..... $7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest..... $3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest..... $2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set..... $4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set..... $3 00
See also *Pails.*

Jack Screws—See Screws.

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ ℔....	24¢	21 ¢
Brass larger than 17 in., ₱ ℔.....	26¢	23½¢

Enameled and Tea Kettles. See *Hollow-Ware.*

Keys—
Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c ..... 33⅓&2%
Hotchkiss' Brass Blanks 40%
Hotchkiss, Copper and Tinned..... 40%
Hotchkiss' Pad. and Cab. 35%
Ratchet Bed Keys..... ₱ doz $4.00, 15%
Wollensak Tinned ..... 50&10%

Knife Sharpeners—
Parkin's.
Applewood Handles... ₱ doz $6.00, 40%
Rosewood or Cocobolo. ₱ doz $9.00, 40%

Knives—
Wilson's Butcher Knives..... 25@30%
Ames' Butcher Knives 25%
Foster Bros.' Butcher, &c. 40%
Nichols' Butcher Knives ..... 40&10%
Ames' Shoe Knives..... 20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread 20%
Hay and Straw ..... See Hay Knives.
Table and Pocket ..... See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent..... $3.50

Knobs—
Door Mineral ..... 65@68%
Door Por. Jap'd ..... 75@78%
Door Por. Nickel ..... $2.00@2.25
Door Por. Plated, Nickel..... $2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs..... 40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain..... 75¢ gro inch, 10%
Furniture, Wood Screws..... 25&10%
Base, Rubber Tip..... 70&10&5%
Picture, Judd's..... 60&10&10@70%
Picture, Sargent's..... 70&10%
Picture, Hemacite..... 35&5%
Shutter, Porcelain..... 65&10%
Carriage, Jap..... ₱ gro 80¢, 60&10%

Ladles—
Melting, Sargent's..... 55&10%
Melting, Reading ..... 35&10%
Melting, Monroe's Pat... ₱ doz $4.00, 40%
Melting, P. S. & W..... 35&10@40%
Melting, Warner's..... 30%

Lanterns—
Tubular—
Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards.....$4.00@4.25
Sq. Lift Wire, with Guards.....$4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75..... 20@25%

Lawn Mowers—
Standard List..... 50&10%
Quaker City..... 60&10%
Enterprise..... 60&10%

Lemon Squeezers—
Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2..... ₱ doz $3.00, 35%
Wood, Common..... ₱ doz $1.70@1.75
Dunlap's Improved ..... ₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz..... 25&10%
Jennings' Star..... ₱ doz $2.50
The Boss..... ₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant..... 50&50&5%
King..... 40&5%
Hotchkiss Straight Flash....₱ doz $12.00

Lines—
Cotton and Linen Fish, Draper's..... 50%
Draper's Chalk..... 60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..... 25%
Cotton Chalk..... 55%
Samson, Cotton, No. 4, $2; No. 4½, $2.3; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro..... 25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton..... 45%
Wire Clothes.. Nos. 12 $4 00, 19 $3 50, 20 $3,00
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co., list Mar. 20, 1889 } 60&10@60 &10&10%
Mallory, Wheeler & Co., list July, '88 } Much lower net
Sargent & Co., list Aug. 1, '88 } prices
Reading Hardware Co., list Feb. 2, '88, } often made.
Perkins' Burglar Proof..... 60&25%
Plate..... 33⅓&2%
F. Many's "Extension Cylinder" $10.50 ₱ doz.
Barnes Mfg. Co..... 40@40&10%
Yale..... net prices
Deitz Flat Key..... 30%
L. & C. Round Key Latches..... 30&10%
L. & C. Flat Key Latches..... 33⅓&10%
Romer's Night Latches..... 15%
Shepardson or U. S..... 35%
Felter or American..... 40&10%
Seed's N. Y. Hasp Lock..... 25%
Cabinet—
Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan. 1, '85.. 33⅓&2%
Deitz, Nos. 36 to 39..... 40%
Deitz, Nos. 51 to 63..... 40&10%
Deitz, Nos. 86 to 96..... 30%
Stoddard Lock Co..... 30&33⅓&5%
"Champion" Night Latches..... 40%
Barnes Mfg. Co..... 40@40&10%
Eagle and Corbin Trunk..... 25&2%
"Champion" Cab. and Combin...33⅓&
Yale..... net prices
Romer's..... 25%
Padlocks—
List Dec. 23, '84..... 75@75&10%
Yale Lock Mfg. Co.'s..... net prices
Eagle..... 25&2%
Eureka, Eagle Lock Co..... 40&2%
Romer's, Nos. 0 to 91..... 30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz..... 40%
Champon Padlocks..... 40%
Hotchkiss..... 30%
Star..... 45%
Horseshoe..... ₱ doz, $9. 40@40&10%
Barnes Mfg. Co..... 40@40&10%
Nock's..... 30%
Brown's Pat..... 25%
Scandinavian..... 90@90&10%
E. T. Fraim's Keystone Scandavian: Nos. 110, 120, 130 and 140..... 90&10% Other Nos..... 65%
Ames Sword Co. up to No. 150..... 40%
Ames Sword Co. above No. 150..... 50%

Lumber Tools.
Ring Peavies, "Blue Line"... ₱ doz $20.00
Ring Peavies, Common..... ₱ doz $18.00
Steel Socket Peavies..... ₱ doz $21.00
Mall. Iron Socket Peavies.... ₱ doz $19.00
Cant Hooks, "Blue Line"... ₱ doz $16.00
Cant Hooks, Common Finish.. ₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish..... $16.00
Cant Hooks, Mall. Socket Clasp, Common Finish..... ₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish..... ₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..... ₱ doz $12.00
Hand Spikes.... ₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks..... ₱ doz $18.00

Lustre—
Four-ounce Bottles.... ₱ doz, $1.75; ₱ gross..... $17.00

Mallets—
Hickory ..... 20&10@20&10&10%
Lignumvitæ..... 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Match Safes—
Dangerfield's Self-Igniting... ₱ doz $1.50

Mattocks. Regular list..... 60&5%

Measures—
Standard Fiberware, No. 1, peck, ₱ dozen, $4; ½-peck, $3.50.

Meat Cutters—
Dixon's ₱ doz..... 40&5%

Nos.	1	2	3	
	$14.00	$17.00		20.00

Woodruff's ₱ doz..... 40&5%

Nos.		100	150
		$15.00	$18.00

Hales Pattern ₱ doz..... 70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American..... 30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$80

Enterprise..... 30%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Pennsylvania..... 40&10%

Nos.	1	2	3	00
₱ doz	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz..... 45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1..... ₱ doz, $26.00, 55&10%
Draw Cut, each:

Nos.	5	2	6	8	
	$50	$75	$80	$225	20@25%

Beef Shavers (Enterprise)..... 20&10@30%
Little Giant..... 50%
Chadborn's Smoked Beef Cutter. ₱ doz $66.00

Mincing Knives—
Am. (2d quality), ₱ gr., 1 blade blades, $12; 3 blades, $18..... net
Lothrop's..... 20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles..... 50&10@60%
Buffalo Adjustable..... ₱ doz $3.00, 25%
Buffalo Double Adj'table. ₱ doz $3.00 25%

Molasses Gates—
Stebbin's Pattern..... 75@75&10%
Stebbin's Genuine.....60@10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70@70&10
Weed's.....20&10%

Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10.....60&10&10%

Money Drawers...₱ doz, $18@$20

Muzzles—
Safety.....₱ doz, $3.00, 25 %

Nails, see Trade Report.
Wire Nails, Papered.
Association list, July 15, 1889....70&5%
Tack Mfrs.' list.....60&10&10%
Wire Nails, Standard Penny.
Card June 1, '89, base.....$3.00 @ $3.10

Nail Puller—
Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $18.00, 10%
Giant, No. 2.....₱ doz, $15.00, 10%
Pelican.....₱ doz, $9.00, 25%

Nail Sets—
Square.....₱ gr., $4.00@$4.25
Round.....₱ gr. $3.25
Buck Bros.....27½%
Cannon's Diamond Point...₱ gr.,$12, 20%

Nut Crackers—
Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₱ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Nuts—
Nuts, off list Dec. 18,1889: Square. Hex.
Hot Pressed..... 5¢ 5½¢
Cold Punched..... 5¢ 5½¢
In lots less than 100 ℔, ₱ ℔, add ¼¢; 1-℔ boxes, add 1¢ to list.

Oakum—
Government.....₱ ℔ 7½@7¾¢
U. S. Navy.....₱ ℔ 6½@6¾¢
Navy.....₱ ℔ 5¼¢@5¾¢

Oilers—
Zinc and Tin.....65@65&10%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc, 60@10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Gem P. D. & Co.....₱ gro. $2

Packing, Steam—
Rubber—
Standard.....60&10@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Standard...50&10&5%
N. Y. B. & P. Co., Empire.....70%
N. Y. B. & P. Co., Salamander, ₱ ℔ 65¢, 30%
Jenkins' Standard.....₱ ℔ 80¢, 35%
Miscellaneous—
American Packing.....10¢@11¢ ₱ ℔
Russia Packing.....14¢ ₱ ℔
Italian Packing.....13¢@14¢ ₱ ℔
Cotton Packing.....15¢@17¢ ₱ ℔
Jute.....7¢@8¢ ₱ ℔

Padlocks—
See Locks.

Pails—
Galvanized Iron—See Trade Report

Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shephard & Co.	2.94	3.15	3.57
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt.....₱ doz $6.00
Fire, Stable and Milk, 14 qt...₱ doz $7.80
Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	
Buggy Pails	4.00	
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt	6.50	7.50

Pencils—
Faber's Carpenters'.....high list 50%
Faber's Round Glit.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters'.....40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60 @ 60&5%

Picture Nails—
Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain.....47½%
1¼ and under, Galvanized.....40%
1½ and over, Plain.....6 %
1½ and over, Galvanized.....47½%
Boiler Tubes, Iron.
1¼ and under.....45%
2 to 4 inch.....50%
4-inch and larger.....52½%

Planes and Plane Irons—
Wood Planes—
Molding.....45&2%
Bench, First Quality.....55&2%
Bench, Second Quality.....60&2%
Bailey's (Stanley R. & L. Co.).....40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.).....40@10%
Miscellaneous Planes (Stanley R. & L. Co.).....20@10%
Victor Planes (Stanley R. & L. Co.).20&10%
Steer's Iron Planes.....35@35&5%
Meriden Mal. Iron Co.'s.30&10@30&10&10%
vis's Iron Planes...30&10@30&10&10%
Birmingham Plane Co.....50@50&5%
Gage Tool Co.'s Self-Setting.....20&10%
Chaplin's Iron Planes.....40@40&5%
Sargent's.....30&10@30&10&10%
Plane Irons—
Plane Irons.....20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros.....30%
Plane Irons, Auburn Tool Co., "Thistle".....35%
Sandusky Tool Co.:
Single and Cut.....30%
Double.....40%
L. & I. J. White.....25%

Pliers and Nippers—
Button's Patent.....30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₱ doz.....20&10@33⅓%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P. S. & W. Cast Steel.....50%
P. S. & W. Tinners' Cutting Nippers, add 5% dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00...30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List.....70&10@70&10&10%
Disston's.....45&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Polish, Metal.
Prestoline.....20&10%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Pokes, Animal—
Bishop's I. X. L.....₱ doz $6.00
Bishop's O. K.....₱ doz $5.25
Bishop's Pioneer.....₱ doz $3.75
Bishop's American.....₱ doz $2.75

Poppers, Corn—
Round or Square, 1 qt..₱ gr $10.00@10.50
Round or Square, 1¼ qt .₱ gr $15@15.50
Round or Square, 2 qt..₱ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, ₱ doz $36.00. 25&10%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers.....₱ doz $16.00@17.00
Leed's.....₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant.....₱ doz $18.00
Kohler's Hercules.....₱ doz $15.00
Kohler's New Champion.....₱ doz $9.00
Schneidler.....₱ doz $18.00
Ryan's Post Hole Diggers...₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50%
Imperial, ₱ doz, $15.....45%

Potato Parers—
White Mountain.....₱ doz $5.00@5.50
Antrim Combination.....₱ doz $8.00
Hoosier.....₱ doz $13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw.....₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25: No. 2 7.25
P., S. & W. Co.....60%

Pulleys—
Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....66⅔&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....50%
Hay Fork, "P" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating...60%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00.....40%

Pumps—
Cistern, Best Makers.....60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper Goods.70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners', P. S. & W. Co., ₱ doz $1.44, 55%
Tin'rs' Hollow Punches P. S. & W. Co. 20&5%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door. Wr't Brass, ₱ ℔ 35¢.....15%
Sliding Door, Bronzed Wr't Iron..₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light. In. ⅝ ¾ ⅞
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet....$2.15 2.70 3.25..net
Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—
Cast Steel, Association goods.....70%
Cast Steel, outside goods.....60&10@70%
Malleable.....70@70&5%
Gibbs Lawn Rake.....$12.00, 50&15%
Canton Lawn Rake.....$9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—
J. R. Torrey Razor Co.....20%
Wostenholme and Butcher, $10.00 to £, 10%
Jordan's AAA1, list Nov. 1, 1889.....50%
Jordan's Old Faithful, list Nov. 1, '89.50%
Electric.....List net

Razor Strops—
Genuine Emerson.....60@60&5%
Imitation "....₱ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₱ doz $2.00
Lamont Combination.....₱ doz $4.00
Jordan's Pat Padded, list Nov. 1, '89.50%
Electric.....List net

Rivets and Burrs—
Iron, list Nov. 17, '87.....40%
Copper.....50@50&10%

Rivet Sets.....50&10%

Rods—
Stair, Brass.....25&2%
Stair, Black Walnut.....₱ doz 40¢

Rollers—
Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%

Rope—
Manufacturers' prices:
Manila...½ in. and larger ₱ ℔ 15 ¢
Manila.....⅜ in. ₱ ℔ 15½¢
Manila.....¼ and 5-16 in. ₱ ℔ 15¾¢
Manila Tarred Rope.....₱ ℔ 14½¢
Manila, Hay Rope.....₱ ℔ 15 ¢
Sisal...½ inch and larger ₱ ℔ 10 ¢
Sisal.....⅜ in. ₱ ℔ 12½¢
Sisal.....¼ and 5-16 in. ₱ ℔ 12¾¢
Sisal, Hay Rope.....₱ ℔ 12 ¢
Sisal, Tarred Rope.....₱ ℔ 11½¢
Sisal, Medium Lathe Yarn.₱ ℔ 11 ¢
Cotton Rope.....₱ ℔ 15@18¢ net
Jute Rope.....₱ ℔ 7½¢

1½% for cash in 10 days.

Rules—
Boxwood.....80&10&10@80&10&10&5%
Ivory.....50@50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—
From 4 to 10, at factory...₱ 100 ℔, $2.60@$2.75
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'.....₱ doz $18.00 net
Gleason's Shield and Toilet.....25%
Mrs. Pott's Irons.....40@40&10%
Enterprise Star Irons.....40%
Combined Fluter and Sad Iron, ₱ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....8¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible.....20@20&5%
National Self-Heating.....30%

Sand and Emery Paper and Cloth—
List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....50%

Sash Cord—
Common.....₱ ℔, 10@11¢
Patent, good quality.....₱ ℔ 13@13½¢
White Cotton Braided, fair..₱ ℔ 28@29¢
Common Russia Sash.....₱ ℔ 13½¢
Patent " " ₱ ℔ 15¢
Cable Laid Italian Sash.....₱ ℔ 22¢@23¢
India Cable Laid " ₱ ℔ 13¢
Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....20&10&5%
B Quality, Drab, 55¢.....20&10&5%
C Quality, White (only).....20½¢@23¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢....30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%

Sash Locks—
Clark's, No. 1, $10; No. 2, $8 ₱ gr. .33⅓%
Ferguson's.....33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60@60&10%
Liesche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Sash Weights—
Solid Eyes.....₱ ton $22.00

Sausage Stuffers or Fillers—
Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry....₱ doz, No. 1, $15.00: No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10@30%
Silver's.....40&10%

Saws—
Disston's Circular.....45@45a5% } Extras sometimes given by jobbers.
Disston's Cross Cuts.....45@45&5%
Disston's Hand 25@25&5%
Atkins' Circular Shingle and Heading 50&10%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₱ foot 24@25¢
Atkins' Hollow Back X Cuts..₱ foot 18¢
Atkins' Mulay, Mill and Drag.....40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand.....30&5@30&10%
W. M. & C., Champion X Cuts, Regular.....₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back.....₱ foot 27¢@29¢
Peace Circular and Mill.....45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard...₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades...40&10@50%
Star Hack Saws and Blades.....25%
Diamond Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Saw Frames—
White Vermont.....₱ gro $9.00@10.00
Red, Polished and Varnished.....₱ doz $1.50, 25%

Saw Sets—
Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita.....₱ doz $3.25&5.25, 40&5@40&10%
Common Lever.....₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00. 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15@20%
Nash's.....20&10@20&10&10%
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut.....12½%
Aiken's Genuine.....$13.00, 50&10%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star, #0, No. 15, $5.50; 20& 10@20&10@10%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.00
Atkin's Criterion.....₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Am. Tool Co.'s Superior.....₱ doz $15,50%

Saw Tools—
Atkins' Perfection.....₱ doz $15.00
Atkins' Excelsior.....₱ doz $6.00
Atkins' Giant.....₱ doz $4.00

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161....₱ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.20@2.30
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family Turnbulls.....30@30&10%
Riehle Bros.' Platform.....40%

Scale Beams—
Scale Beams, List Jan. 13, '82...50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30&10%
Box, 1 Handle.....₱ doz $4.00. 10%
Box, 2 Handle.....₱ doz $6.00, 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common.....₱ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons..33⅓@ 33⅓&10%
Stearns' Frames and Corners.25@25&10%

Screw Drivers—
Douglas Mfg. Co.....20&10&10%
Disston's.....45&10%
Disston's Pat. Excelsior.....45&10%
Buck Bros.....30%
Stanley R. & L. Co.'s Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....66⅔&10&10%
Knapp & Cowles' No. 1.....60&20@70%
No. 1 Extra.....60@60&10%
Nos. 00 & 4.....50&5@50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....50%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₱ doz $6.00, 25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw Driver Bits.....₱ doz 50@75¢
Screw-Driver Bits, Parr's.....₱ gro $6.25
Fray's Hol. Hdle. Sets.No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....20&10%
Brace Screw-Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....

Screws—
Wood Screws—List March 1, 1889.
Flat Head Iron.....50%
Round Head Iron.....40%
Flat Head Brass.....45%
Round Head Brass...35%
Flat Head Bronze..45%
Round Head Bronze 35%
} Extra 5 @ 10 % often given.

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%
Bench and Hand—
Bench, Iron.....55&10@55&10@10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20@10%
Hand, Wood.....25@10@25@10@5%
Lag, Blunt Point, list Jan. 1, 1890.75@10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890.....75%
Bed.....25&5%
Hand Rail, Sargent's.....60%@10%
Hand Rail, H. & B. Mfg. Co...70@10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60@10@60@10&5%
Jack Screws Stearns'.....40@40@10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths..50&5&2@50@10@2%

Shears—
American (Cast) Iron...75@10@75&10@5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....20@2%
Seymour's, List, Dec., 1881.
60@10@10@60@10@10@5%
Heinisch's, List, Dec., 1881.
60@10@10@60@10@10@5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80@10%
Second quality C. S. Trimmers.
80@10@80@10@10%
Acme Cast Shears.....10@10%
Diamond Cast Shears.....10%
Clipper.....10@10%
Victor Cast Shears.....75&10@75&10@5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%
Electric.....List net

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50@10@60@10%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60@10@2%
Patent Roller.....60@10@2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60@2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60@10@2%
Sargent's list.....60@10%
Reading list.....60@10@10%

Ship Tools—
L. & I. J. White.....20@5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory. $4.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ₺ 9¢
1000 ₺ lots.....₱ ₺ 9½¢
500 ₺ lots.....₱ ₺ 10¢

Shot—
(Eastern prices 2¢ off, cash, 5 days.
Drop, ₱ bag, 25 ₺.....$1.19
Drop, ₱ bag, 5 ₺.....29
Buck and Chilled, ₱ 25-₺ bag.....1.44
Buck and Chilled, ₱ 5-₺ bag.....34

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).35%
St. Louis Shovel Co.....20@20@7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20@7½%
Lehigh Mfg. Co.....50@10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.).30@10@40%
Rowland's, Black Iron.....50@10%
Rowland's Steel.....60@5@60@10%

Shovels and Tongs—
Iron Head.....60@10@60@10@5%
Brass Head.....60@10@10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Jan. 3, 1889.....45&10%
Coldbrookdale Iron Co.....50@10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Mann's Tin Rim.....50@25%
Buffalo Metallic, S. S. & Co.....50@25%
Shaker (Barler's Pat.) Flour Sifters.....₱ doz $2.00; ₱ gr $21.60
Electric.....₱ gr $18.00
A. & W. Sifters.....₱ doz $2.00
Hunter's.....₱ doz $2.00
Smith's Adjustable Sifters...₱ doz $2.00
Smith's Adjustable Milk Strainer.
₱ doz $2.00
Smith's Adjustable T. & C. Strainer.
₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	75¢	95¢
Mesh 20, Nested, ₱ doz..	90¢	$1.05
Mesh 24, Nested, ₱ doz..	$1.10	1.20

Slates—
School, by case.....50@50&10%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Saegen's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60&10&2%
Covered Spring.....60&10&10%

Soldering Irons—
Soldering Copper.....22 @ 23¢
Covert's Adjustable, list Jan. 1, 1886.
25&2%

Spittoons, Cuspidors, &c.
Standard Fiberware—
Cuspidors, 8¼-inch, ₱ doz., No. 5, $8; No. 5X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%
Cincinnati.....25&10%

Spoke Trimmers—
Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz.
55&10%
Douglas'.....₱ doz $9.00, 20%
Cincinnati.....25%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list. ..70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers....40, 15, 10&5%
C. Rogers & Bros.....40, 15, 10&5%
Rogers & Bro.....40, 15, 10&5%
Reed & Barton.....40&10%
Wm. Rogers Mfg. Co.....40, 15, 10, 5&5%
Simpson, Hall, Miller & Co..40, 15, 10&5%
Holmes & Edwards Silver Co.....
40, 15, 10, 5&5%
L. Boardman & Son.....60%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50&5% cash
Boardman's Britannia Spoons, case' lots.....60&5% cash

Springs—
Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron.....} 75&10@80%
Nickel-Plated.....} full cs. ex. 10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares.
25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibre Ware—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—
Fence Staples, Galvanized.} Same price
Fence Staples, Plain.....} as B'rb Wire
See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates...33⅓&5@40%
Reversible Ratchet.....30%
Gardner.....25%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₱ ₺ 2½¢
Washita Stone, Extra.....₱ ₺ 10@20¢
Washita Stone, No. 1.....₱ ₺ 14@15¢
Washita Stone, No. 2.....₱ ₺ 10@11¢
Washita Slips, No. 1, Extra..₱ ₺ 30@38¢
Washita Slips, No. 1.....₱ ₺ 24@25¢
Arkansas Stone, No. 1, 4 to 6 in₱ ₺ $1.50
Arkansas Stone, No. 1, 6 to 9 in₱ ₺ $1.85
Turkey Oil Stone, 4 to 8 in.....₱ ₺ 40¢
Turkey Slips.....₱ ₺ $1.00@1.50
Lake Superior, Chase.....₱ ₺ 16¢
Lake Superior Slips, Chase...₱ ₺ 31@32¢
Seneca Stone, Red Paper Brand...₱ ₺
16@20¢
Seneca Stone, High Rounds..₱ ₺ 20@25¢
Seneca Stone, Small Wheels..₱ gro $24.00

Stove Polish—
Joseph Dixon's.....₱ gro $6.00,·10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror.....₱ pro $6.00, —%
Lustro.....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ₺ $5.00
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro $ cans
Yates' Liquid, 2 3 5 10 gal...8¢
₱ gal...$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-₺ cans, ₱ ₺ 15¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ₺ cans.....12½¢
Black Jack Water Paste, 5 and 10 ₺ cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00

Tacks, Brads, &c.—
List Oct. 19, 1889, extra 10&2 % cash.
Carpet Tacks—
American Iron, Blued.....70%
American Iron, Tinned or Cop'd...70%
Steel, Plain or Bright.....70%
Steel "inned or Coppered.....70%
Swedes Iron, Blued.....70%
Swedes Iron, Tinned or Co,'d .70%
American Iron Cut Tacks.....67½%
Swedes Iron Upholst'rs' Tacks, S.S...70%
Swedes Iron Upholst'rs' Tacks, Tinned, S.S.....70%
Swedes Iron Card and Upholsterers' Tacks, Lanc.....66⅔%
Swedes Iron Card and Upholsterers' Tacks, Tinned, Lanc.....66⅔%
Gimp and Lace Tacks Lanc., Swedes Iron.....66⅔%
Gimp and Lace Tacks, Lanc., Swedes Iron, Tinned.....66⅔%
Gimp and Lace Tacks, S. S.....70%
Gimp and Lace Tacks Tinned, S. S..70%
Swedes Iron Basket or Trimmers' Tacks, Lanc.....66⅔%
Miners' Tacks, S. S.....70%
Bill-Posters' or Railroad Tacks, Lanc., Swedes.....66⅔%
Bill-Poster's' or Railroad Tacks, S.S..70%
Copper Tacks.....50%
Copper Finish. & Trunk Nails.....50%
Cigar Box Nails.....50%
Zinc Glaziers' Points.....50%
Picture-Frame Points.....50%
Looking-Glass Tacks.....50%
Brush Tacks.....50%
Tin-Capped Trunk Nails.....60%
Finishing Nails.....65%
Trunk & Clout Nails, Black & Tin'd.66⅔%
Common and Patent Brads.....60%
Hunsarian Nails.....66⅔%
Basket and Chair Nails.....62½%
Leathered Carpet Tacks.....40%
Miscellaneous—
Double-Pointed.....82½%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Tapes, Measuring—
American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale— Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—
Stamped, Japanned and Pl'ed, list Jan. 20 1887.....70&10@70&10&5%

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s ₱ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₱ doz, $24, 55&10%
Acme.....₱ doz, $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Aug. 1, 1889.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50, 15%
Mouse, Bonanza.....₱ gr $10.00
Mouse Delusion.....₱ gr $15.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz., 90¢; in full cases, ₱ doz. ..75¢
Hotchkiss Imp. Rat Killer..₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50

Trowels—
Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Pease's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ⅛ ₺ Balls	22¢	30¢
No. 12, ¼ and ⅛ ₺ Balls	21¢	29¢
No. 18, ¼ and ⅛ ₺ Balls	18¢	28¢
No. 24, ¼ and ⅛ ₺ Balls	18¢	28¢
No. 36, ¼ and ⅛ ₺ Balls	16¢	27¢
No. 264, Mattrass, ¼ and ⅛ ₺ Balls	48@50¢	
Chalk Line, Cotton, ⅛ ₺ Balls	25¢	
Mason Line, Linen, ⅛ ₺ Balls	55¢	
2-Ply Hemp, ¼ and ⅛ ₺ Balls (Spring Twine)	11½¢	
3-Ply Hemp, 1 ₺ Balls	12¢@12½¢	
5-Ply Hemp, 1½ ₺ Balls	11¢@11½¢	
Cotton Wrapping, 5 Balls to ₺	15¢@16¢	
2, 3, 4 and 5-Ply Jute, ⅛ ₺ Balls	10¢	
Wool	6½¢@64¢	
Paper	13¢@14¢	

Cotton Mops, 6, 9, 12 and 15 ₺ to doz..18¢

Vises—
Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60%&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....20&10%

Wagon Boxes—
Per ₺.....2¾¢

Wagon Jacks—
Daisy.....35%

Washer Cutters—
Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓%
Penny's.₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Washers—

Size.....	⅛	5-16	⅜	½	⅝	¾	1
Washers....	6¼	5¼	4¼	3½	3	3	3

In lots less than 200 ₺, ₱ ₺, add ¼¢, 5-₺ boxes 1¢ to list.

Wedges—
Iron.....₱ ₺ 3½¢
Steel.....₱ ₺ 4 ¢

Well Buckets, Galvanized—
See Trade Report.
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₱ doz $4.00@4.25

Well Wheels—
8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—
*Iron—*See Trade Report.
Market,
Br. & Ann., Nos. 0 to 18.....65%
Copp'd, Nos. 0 to 18.....60%
Galv., Nos. 0 to 18.....55%
Tin'd, Tinned list Nos. 0 to 18.....55%
Stone,
Br. and Ann'd, Nos. 16 to 18.....67½%
Bright and Ann'd, Nos. 19 to 26.67½&5%
Br. and Ann'd, Nos. 27 to 36....70&10%
Tinned.....67½%
Tinned Broom Wire.....67½@67½&5%
Galvanized Fence.....55%
Annealed Fence, Nos. 8 and 9.....65%
Annealed Grape, Nos. 10 to 14.....60%
Brass, list Jan. 18, 1884.....25%
Copper, list Jan. 18, 1884.....25%
Barb Fence.....See Trade Report
Wire on Spools.....55%
Malin's Steel and Tin'd Wire on Spools, 50%
Malin's Brass and Cop. Wire on Spools 40%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30
Steel Music Wire, Nos. 12 to 30..55¢ ₱
Picture Wire.....New list 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—
Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting.....70@70&10%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....30%
Iron, Galvanized.....27½%
Cast Steel.....35%

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40@10@50%
Baxter's Diagonal.....40@10@50%
Coes' Genuine.....50&2%
Coes' "Mechanics".....50@10@2%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co. 70&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard...70&10%
Goes' Pattern, Wrought.....
Girard Agricultural.....} 75&10@75 &10&5%
Lamson & Sessions' Agric'l..
Sterling Wrought.....
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....15&10%
Cincinnati Monkey Wrenches....15&10%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1888, 80&20@80&20%

CURRENT METAL PRICES.

JANUARY 29, 1890.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
¾ to 2 in. round and square.. 1 to 6 in. x ⅝ to 1 in	₩ lb 2 10 @ ....¢
Refined Iron:	
¾ to 2 in. round and square.. 1 to 4 in. x ⅝ to 1½ in. 4½ to 6 in. x ⅝ to 1 in	₩ lb 2.30 @ ....¢
1 to 6 in. x ¼ and 5-16	₩ lb 2.50 @ ....¢
Rods—⅝ and 11-16 round and sq.	₩ lb 2.40 @ ....¢
Bands—1 to 6 x 3-16 to No. 12	₩ lb 2.60 @ ....¢
"Burden Best" Iron, base price	₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price	₩ lb 2 80 @ ....¢
"Ulster"	₩ lb 3.10 @ ....¢
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16	₩ lb 3.00	@ 3.00¢	3.50 @	....¢
17 to 20	₩ lb 3.25	@ 3 25¢	3.50 @	3.75 ¢
21 to 24	₩ lb 3.35	@ 3.35¢	3.75 @	....¢
25 and 26	₩ lb 3 45	@	3.75 @	....¢
27	₩ lb 3.55	@ 3.62½¢	4.00 @	....¢
28	₩ lb 3.75	@ .. ..¢	4.25 @	....¢
	B. B.		2d qual.	
Galv'd, 14 to 20,	₩ lb, 5.00	@ ...	4.75½ @	....¢
Galv'd, 21 to 24,	₩ lb, 5.37½	@ ...	5.12½ @	....¢
Galv'd, 25 to 26,	₩ lb, 5.75	@ ...	5.50 @	....¢
Galv'd, 27	₩ lb, 6.12½	@ ...	5.85½ @	....¢
Galv'd, 28	₩ lb, 6.50	@ ..	6.23 @	..¢
Patent Planished	₩ lb A 10¢		B, 9¢	
Russia	₩ lb 9½¢ @ 10¢			
American Cold Rolled B. B.	₩ lb 5¢ @ 7¢			
Craig Polished Sheet Steel	₩ lb, 8¼¢			

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d qualty	₩ lb 14 ¢
3d quality	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs	23 ¢
Straits, Pigs	22½¢
English, Pigs	23 ¢
Straits in Bars	23¼¢

Tin Plates.

Charcoal Plates.—Bright.

			Per box.
Melyn Grade	IC, 10 x 14	@	$6.50
" "	IC, 12 x 12	@	6.75
" "	IC, 14 x 20	@	6.50
" "	IC, 20 x 28	@	13.00
" "	IX, 10 x 14	@	8.00
" "	IX, 12 x 12	@	8.25
" "	IX, 14 x 20	@	8.00
" "	IX, 20 x 28	@	15.75
" "	DC, 12½ x 17	@	6.00
" "	DX, 12½ x 17	@	7.50
Calland Grade	IC, 10 x 14	@	6.50
" "	IC, 12 x 12	@	6.75
" "	IC, 14 x 20	@	6.40
" "	IX, 10 x 14	@	7.65
" "	IX, 12 x 12	@	7.90
" "	IX 14 x 20	@	7.65
Allaway Grade	IC, 10 x 14	@	5.60
" "	IC, 12 x 12	@	5.75
" "	IC, 14 x 20	@	5.60
" "	IC, 20 x 28	@	11.00
" "	IX. 10 x 14	@	6.75
" "	IX, 12 x 12	@	6.90
" "	IX, 14 x 20	@	6.75
" "	IX, 20 x 28	@	13.50
" "	DC, 12½ x 17	@	5.30
" "	DX, 12½ x 17	6 00 @	6.80

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20		@	$5.12½
	10 x 20	@	7.25
	20 x 28	@	10.25
	IX, 10 x 14, 14 x 20	@	6.00
BV Grade.—IC, 10 x 14, 14 x 20		@	4.87½

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20	@	$5.10
20 x 28	@	10.25
IX, 14 x 20	@	5.90
20 x 28	@	11.80
Abacarne Grade.—IC, 14 x 20	@	4.87½
20 x 28	@	9.87½
IX, 14 x 20	@	5.81
20 x 28	@	11.60

Tin Boiler Plates.

IXX, 14 x 26	112 sheets	$13.00 @	$13.00
IXX, 14 x 28	112 sheets	@	13 25
IXX, 14 x 31	112 sheets	@	14.75

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake	@ 15¢
Baltimore Grade	@ 14¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	...
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	31	....	....	....	....
84	96		23	24	29	34	....	....	....	....
84		96	24	25	30	35	....	....	....	....
Over 84 in. wide			25	27	...	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz.
Per pound	$0.25	0.27	0 29	0.32

Bolt Copper, ⅝ inch diameter and over, per pound 23¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb
12 oz. and lighter.....33¢. By the case...32¢ ₩ lb

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1½
8-14	6-12	37	33	30	29	28	27	24
15	13	38	33	31	30	29	28	25
16	14	39	34	32	31	30	29	25
17	15	40	35	33	30	31	30	26
18	16	42	36	34	32	31	30	27
19	17	43	37	35	34	33	32	29
20	18-19	44	39	37	36	35	34	31
21	20	46	41	39	38	37	36	34
22	21	48	42	40	39	38	37	36
23	22	50	44	42	41	40	39	39
24	23	53	46	44	43	41	40	41
25	24	56	49	46	45	44	43	45

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	
Discount from list	25 @ ... %

Roll and Sheet Brass.

Discount from list. 25 %

High Brass Rods.

Over 1 inch diameter	27¢
¼ inch to 1 inch diameter, both inclusive	34¢
No. 8 and less than ¼ inch diameter	36¢
Smaller than No. 8	30¢

Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.

Western Spelter	6¼¢
"Bergenport"	5¢
"Bertha"	5¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.

600 lb casks	6¼¢
Per lb	7¼¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4¼¢
Newark	4¼¢
Bar	4½¢
Pipe, subject to trade discount	6 ¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes subject to trade discount	45¢
Sheet, subject to trade discount	6¾¢

Shot.

Eastern prices 2¢ off, cash, 5 days.

Drop, ₩ 25-lb bag	$1.19
Drop, ₩ 5-lb bag	.29
Chilled and Buck, ₩ 25-lb bag	1.44
Chilled and Buck, ₩ 5-lb bag	34
Dust, ₩ bag	1.80

Solder.

½ @ ½ (Guaranteed)	14¾¢
Extra Wiping	12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ lb 31¢
Hallett's	" 22¢

Fittings.

Cast Iron Fittings, Black and Galvanized	75 %
Cast Iron Fittings, Bushings & Plugs	75&10@75&10&5 %
Cast Iron Fittings, Flanges	75 %
Malleable Iron Bushings	75&10@75&10&5 %
Malleable Iron Unions	70 %
Malleable Iron American Unions	55 %
Malleable Iron Unions, Keystone	55 %
Wrought-Iron Nipples	75&5@75&10 %
Wrought-Iron Couplings	70 %
Wrought-Iron Long Screws	70@70&5 %
Casing Fittings	60 %
Malleable Iron Fittings	40 %

Valves, Cocks, &c.

Iron Body Valves	70 %
Throttle Valves, Iron Body	70 %
All-Iron Valves	65 %
Compression Gauge Cocks	60 %
Mississippi Gauge Cocks	60 %
Register Gauge Cocks	65@65&10 %
Air Cocks and Radiator Air Cocks	65@65&10 %
Steam Gauge Cocks	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle	65@65&10 %
Globe Oil Cups	55 %
Common Lubricators	65@65&10 %
Lubricators with Air Cocks	65@65&10 %
Iron Body Lubricators	60 %
Steam Whistles	65 %
Whistle Valves	65 %
Water Gauges	65 %
Brass Expansion Joints	55 %
Pump Valves	55 %
Soldering Unions	65 %
Soldering Nipples	70 %
Brass Unions (Union Joints)	55 %
Radiator Nipples	60 %
Fusible Plugs	60 %
Oil Pumps	55 %
Self-Acting Air Valves	65 %
Vacuum Valves	55 %
Steam Swing Joints	55 %
Iron Strainers	55&10 %
Jenkins' Iron Body Valves, except Gate Valves	60&10 %
Jenkins' All-Iron Valves, except Gate Valves	60 %
Jenkins' Iron Body Gate Valves	55 %
Jenkins' All-Iron Gate Valves	55 %
Iron Cocks, all Iron	65 %
Iron Cocks, with Brass Plugs	65 %
Brass Globe, Angle and Cross Valves	65 %
Brass Globe Valves, Finished	45 %
Brass Globe and Angle Valves, hose outlet	65 %
Brass Garden Hose Valves	65 %
Brass Caps for Hose Valves	60 %
Brass Horizontal, Vertical and Angle Check Valves	65 %
Brass Safety Valves	65 %
Brass Safety Valves, low pressure	65 %
Brass Safety Valves, low pressure, with balance weight	65 %
Brass Butterfly Valves	55 %
Brass Throttle Valves	55 %
Brass Radiator Valves	65 %
Brass Radiator Valves, Jenkins'	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves	65 %
Brass Jenkins' Gate Valves	50 %
Brass Steam Cocks	60 %
Brass Gas, Meter and Union Meter Cocks	60 %
Brass Fittings, Rough	60 %
Brass Fittings, Finished	25 %
Brass Bushings	60

Plumbers' Brass Work.

Ground Key Work, Rough	60 %
Ground Key Work, Finished	55 %
Compression Work	60@60&5 %
Compression Work, Grundy, Heavy Pattern	55 %
Chain Stays	60 %
Basin Plugs	60 %
Sink or Bath and Wash Tray Plugs	60 %
Basin Clamps	55 %

PAINTS, OILS AND COLORS.

Animal and Vegetable Oils.

Linseed, City, raw	per gal	60 @	62
" " boiled		63 @	65
" Western, raw		59 @	60
Lard, City, Extra Winter		@	55
" " Prime, present make		@	53
" " Extra No. 1		45 @	48
" " No. 1		42 @	44
" Western, prime		52 @	53
Cotton-seed, Crude, prime		@	28
" " off grades		26 @	27
" Summer Yellow, prime		@	34
" " " off grades		32 @	33
Sperm, Crude		@	70
" Natural Spring		@	..
" Bleached Spring		@	..
" Natural Winter		78 @	80
" Bleached Winter		83 @	85
Whale, Crude		40 @	..
" Natural Winter		46 @	..
" Bleached Winter		48 @	..
" Extra Bleached		51 @	..
Sea Elephant, Bleached Winter		58 @	60
Menhaden, Crude, Sound		22 @	23
" Crude, Southern		@	..
" Light Pressed		27 @	28
" Bleached Winter		32 @	35
" Extra Bleached		36 @	..